Customization Reference Manual

MULTSESS/HPO

Version 2.0

MVS Operating Environment

PassGo

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Changes will be made periodically to the information contained in this book. If your book does not accurately reflect the level of product you are using, this may be due to a fix being applied to the product which has still to be released as a book update.

Preface

Prerequisites for running MULTSESS/HPO

MULTSESS/HPO has been designed to run under the latest releases of MVS, MVS/XA and MVS/ESA running ACF/VTAM V3.3 and earlier, in both SNA and non-SNA environments.

Devices supported by MULTSESS/HPO

- all models of 317x, 318x, 319x and 327x (or their equivalents), utilising the maximum available screen display area
- the 3290 Information Panel with each interactive panel in 3270 mode
- LUTYPE 1 printers (SNA printers with the SCS feature)
- devices attached through NTO
- IBM 3767 and compatible devices

Application sessions using MULTSESS/HPO are supported in the terminal's native mode.

Terminal to MULTSESS/HPO sessions are supported in model 2 mode.

Related publications

The MULTSESS/HPO User Installation Manual describes how to install MULTSESS-HPO in your environment.

The MULTSESS/HPO User Reference Manual contains details of commands that the user may enter at the terminal, and error messages that may be issued to the terminal.

The MULTSESS/HPO Technical Reference Manual describes MULTSESS/HPO's various concepts and features in technical detail.

The ATP/HPO Installation and Operation Manual provides an overview of ATP/HPO installation procedures and describes the commands and language statements that are specific to ATP/HPO.

Future publication changes

Changes may be made periodically to MULTSESS/HPO publications to reflect new releases and facilities. When this occurs you will be supplied with update pages or a new updated manual.

Readers' comment form

A form for readers' comments is provided at the back of this manual.

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Introduction

About the MULTSESS/HPO Customization Reference Manual

This MULTSESS/HPO Customization Reference Manual is for use by technical personnel who are going to install and customize MULTSESS/HPO.

On completion of installation procedures (described in the MULTSESS/HPO User Installation Manual), the customization material contained in this manual may be reviewed and applied as required to suit your site requirements. The Customization Reference Manual provides the following:

- logging on information, with particular reference to special logon features and logo customization. These features are addressed in *Chapter 1 - Logging on*.

- logging off information, with particular reference to the disconnect/reconnect feature. This is described in *Chapter 2 - Logging off*.

- features which allow the MULTSESS/HPO user to optimize control of multiple sessions. These are described in *Chapter 3 - Session control*.

- general reference material on features available to MULTSESS/HPO users. This is provided in *Chapter 4 - Miscellaneous MULTSESS/HPO features*.

- a description of the exit routines used to implement installation specific refinements to MULTSESS/HPO. This is provided in *Chapter 5 - User exits*.

MULTSESS/HPO Installation requirements

The customization features in this manual should only be reviewed on completion of the appropriate installation procedures. A checklist for installing MULTSESS/HPO is as follows:

- load the distribution tape following instructions in the Installation Guide which accompanies the tape.

- define MULTSESS/HPO to VTAM as described in the MULTSESS/HPO User Installation Manual in *Chapter 2 - VTAM updates*.

- define your applications to MULTSESS/HPO as described in the MULTSESS/HPO User Installation Manual in *Chapter 3 - Defining applications to MULTSESS/HPO*.

- define your users to MULTSESS/HPO as described in the MULTSESS/HPO User Installation Manual in *Chapter 4 - Defining users to MULTSESS/HPO*.

- review the available startup options as described in the MULTSESS/HPO User Installation Manual in *Chapter 5 - Pre-startup and startup options*.

- review performance considerations as described in the MULTSESS/HPO User Installation Manual in *Chapter 1 - Installation overview*.

- create the JCL to run MULTSESS/HPO as described in the MULTSESS/HPO User Installation Manual in *Chapter 1 - Installation overview.*

- review security system considerations as described in the MULTSESS/HPO User Installation Manual in *Chapter 1 - Installation overview.*

- initialize MULTSESS/HPO as described in the MULTSESS/HPO User Installation Manual in *Chapter 1 - Installation overview.*

- refer to the MULTSESS/HPO User Installation Manual in *Chapter 8 - Installation verification* to perform the installation verification procedure.

Chapter 1 - Logging on

Userid and password prompts

The MULTSESS logo contains prompts for userid and password. When a userid is entered, the user is assigned the security attributes defined by the matching (unique or generic) directory entry. These include:

- the requirement, or not, for a password
- how the password will be validated:
  - against a proprietary security database
  - by a user exit routine
  - against the MULTSESS directory of users
- the profile to be executed at logon time
- the VTERMs the user is authorized to use
- the applications the user is authorized to access.

Terminal logon feature

The security attributes that are assigned when a userid is entered may also be assigned using the terminal name instead of the userid.

The terminal logon feature is enabled by coding the startup parameter TERMINAL LOGON=YES. Terminals may be defined (uniquely or generically) in the MULTSESS directory in exactly the same way as users.

The terminal logical unit name (luname) is defined on a USER statement in place of the userid. All other directory statements and parameters may be used to define the security attributes of the terminal.

If a user presses <Enter> at the MULTSESS logo without typing a userid, MULTSESS will use the terminal luname in place of a userid. The directory will be searched in the normal way to check that the terminal is allowed to connect. This can be automated, using customization fix 14, to ensure that all terminals connecting to MULTSESS generate a logon with LUNAME as a userid.

The directory entry may specify that a password is required. If so, the user will be prompted to enter the password.

Access authorization

The two techniques for authorizing access, based on userid or terminal name may be combined. The directory entry for the terminal may specify a fairly low level of authorization, for example, a command authority of G. A user may, however, enter a userid at the terminal and be assigned the authorization appropriate to the userid; and this may be higher than G.

Sample directory for the terminal logon feature

```
*
*  Tech group are allocated userids allowing
*  unlimited access.
*
USER     TECH001  RACF  A  *
PROFILE  ADMIN
VTERM    POOL*
SESSION  *
*
USER     TECH*    RACF  C  15
PROFILE  ????PROF
VTERM    POOL*
SESSION  *
*
*  All terminals in the Los Angeles branch
*  office are allowed access to production
*  CICS and IMS with suitable logon scripts.
*  The clerks only need to press ENTER to
*  log on to MULTSESS.
*
USER     LULA*    NOPASS G 2
PROFILE  LATERMS
VTERM    POOLLA1
SESSION  PRODCICS POOLLA1 * * CICLOGON
SESSION  PRODIMS  POOLLA1 * * IMSLOGON
*
```

Passing CINIT data to MULTSESS

Initial connection

MULTSESS will accept and process up to 120 characters of CINIT logon data passed when a terminal first connects to MULTSESS. The data must begin with a valid MULTSESS logon command. The userid, and optionally the password, will be verified in the normal way.

Other MULTSESS commands may follow the logon command, up to an overall total of 120 characters, each command separated by the global default MULTSESS command character. This is set by the COMMAND-CHAR startup option.

All the specified commands will be processed before control is returned to the user. If a SESSION command is specified as the last command in the string, the user is placed immediately into the application session, optionally with an ATP logon script. The first screen image the user sees is the final application image. For example:

    LOGON APPLID(MULTSESS) DATA('L USER1 PW1;SESS TSO')

This facility is particularly useful for users of an advanced network monitor program such as Network Control Interface (NCI), which is capable of verifying userids and passwords and passing variable CINIT data to target applications.

Since the network monitor program has already validated the user's userid and password, it would be tedious for the user to have to re-enter the same information into MULTSESS. By sending MULTSESS a logon command as CINIT data, the MULTSESS logo is bypassed and the user is immediately displayed his tailored MULTSESS menu, or his first application screen image.

Customization fix 14 can be used with the terminal-logon feature to provide a LOGON APPLID(MULTSESS) DATA('L') command, or equivalent, at all logons.

Customizing the MULTSESS /HPO logo

Logo area

The screen image displayed when a terminal first connects to MULTSESS contains a 22 line logo area. Line 23 contains input areas for userid, password and new password. Line 24 is reserved for error messages. The logo area may be replaced with any information specific to your installation. This may be your company emblem or any other information you wish your users to see. It is good practice to include a message explaining the prompts for userid and password which appear on line 23, for example 'Please enter your userid and password below'.

Logo location

The logo used when MULTSESS is started is contained in the partitioned dataset member pointed to by the LOGO DD statement of the JCL used to start MULTSESS.

Logo on startup

When MULTSESS is started, the logo is read into storage and compressed. The compressed logo panel is sent to all terminals that connect to MULTSESS, and selectively to terminals where a user has disconnected, without unnecessary I/O overhead to the logo dataset.

Logo load command

The LLOAD (logo load) command may be used to dynamically reload the same or a different logo member whilst MULTSESS is running. Issuing the LLOAD command will read the new logo into storage, compress the data and **automatically refresh** all terminals currently displaying the old logo.

Hot news messages

The 3 hot news message lines which are displayed on terminals in dynamic panel mode may be included in the logo definition. Having updated any or all of the hot news lines using the SET NEWSn command, the user should issue LLOAD to refresh all terminals with the updated news.

Hot news broadcast messages may be included in the logo by including the variables &SYSNEWS1, &SYSNEWS2 and &SYSNEWS3 in the logo definition. Because broadcast messages may be up to 79 characters in length, the news variables will only be recognized when coded starting in column 2 of a logo line. This allows specification of a leading attribute whilst ensuring that message truncation does not occur. News variables are resolved at the time the logo is loaded into storage. After amending the news lines with appropriate SET NEWS commands, the LLOAD command may be used to reload the logo and refresh terminals with the updated news.

Logo member

The logo member contains up to 22 records, 80 bytes in length, defining data to be displayed on lines 1 - 22 of the terminal. Lines 23 and 24 of the display area are reserved for MULTSESS use. Attributes may be assigned using the special characters defined by the PANEL= startup option. If this parameter is omitted, the following default values apply:

@	High Intensity	Protected	(White)
+	High Intensity	Unprotected	(Red)
*	Low Intensity	Protected	(Blue)
$	Low Intensity	Unprotected	(Green)
%	Non-Display	Unprotected	

Attribute characters are expanded to 2 bytes in the 3270 data stream. A character will be lost from the end of each logo definition line for every attribute in the line.

Using a customization zap

The LLOAD command loads a logo containing 22 lines, displayed on screen lines 1 to 22. Lines 23 and 24 are automatically added by MULTSESS and cannot be changed, either by the user or the installation process.

With a customization zap you can change the three prompts userid, password and newpass, the length of the three input fields, and the wording of the PFK1 help message. The length of each element cannot be increased. You can remove input fields, and also change the value of the help and logoff PFKs.

A zap can be applied to the MULTSESS load library by using the IBM utility AMASPZAP. An example of JCL to run AMASPZAP and implement the ZAP (as supplied in the fixlist - member TNL27001) is given in *Appendix A - Sample zaps*. The supplied logon lines are as shown in the example. This example changes the ===> part of the prompt to >>>>, and reduces the first two input fields to 6 characters.

The offset is reduced by two (5BF7 to 5BF5, 5C4D to 5C4B), and the four zeros, corresponding to two bytes, are moved to the end of the line.

Since the userid input field is reduced by two bytes, the D207 instruction, in TPMSEND and TPLOGON, is changed to D205 (moves six bytes).

The third input field is reduced to zero length (ie removed), the offset is reduced by eight (5CE2 to 5C5A) and the associated prompt is blanked out.

Method

The length of the input fields is given by the number of zeros (for example 16 for an eight byte field), followed by 11XXXX1DF8, where XXXX is an offset. To reduce the length of the input field, remove leading zeros (two per byte) and put them at the end of the line, and reduce the offset by the corresponding amount (refer to the 3270 Information Display System Reference Summary). If the length of the userid input field is reduced, but not removed altogether, the MVC command in TPMSEND and TPLOGON must be changed to reflect the new userid length - D206 for 7 bytes, D205 for 6 bytes, etc.

If the userid input field is to be completely removed in order to only allow terminal logon, change the cursor address (offset X'0007' in TPLOG) from 5B6F to 5CC5. This ensures that the cursor starts off in the password field. In this case TERMINAL-LOGON=YES must be specified as a startup parameter.

It is even possible to remove all the input fields. In this way, if TERMINAL-LOGON=YES has been specified, logon will be invoked by simply pressing the <Enter> key.

To change prompts, insert the new characters in hexadecimal, padding with spaces (Hex 40) to the original length.

To change the PF Keys for help and logoff, change the value of the PFK in module TPCP1 (ie F1=PFK1, F2 = PFK2, etc and C1 = PFK13, C2 = PFK14 etc).

Note: Two values are specified for each function, so that PF Key pairs can be specified (eg PFK1/PFK13). If customization fix 19 is in use, items TPMSEND and TPLOGON in the example may need reviewing.

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Chapter 2 - Logging off

The disconnect/reconnect feature

MULTSESS/HPO management

MULTSESS manages multiple sessions on behalf of a single terminal, providing a friendly and productive environment for the end user. Because the user's sessions are kept open and are available at the press of a key, the repetitive and resource-consuming process of application logon and security validation is limited to only once or twice per day. Typically a user will log on to MULTSESS at the start of the day and open all his sessions, work with the sessions throughout the day and close all sessions and logoff from MULTSESS at the end of the day.

However, there are times when a user will wish to interrupt his terminal session but have all application sessions maintained for future reference, for instance during a lunch break, or when moving to a different terminal to show a colleague the output from an on-line transaction.

Disconnect/reconnect feature

The disconnect/reconnect feature enables a user to interrupt his work and to return to it later, using the same or a different terminal, at exactly the point he left off. The DISCONNECT command will put the user in 'disconnect' status. The user's MULTSESS environment and all active sessions are preserved. If any application data is received whilst the user is disconnected, this will be saved until the user reconnects.

DISCONNECT options

After execution of a DISCONNECT command, the ownership of the terminal is determined by the setting of the DISCONNECT= startup parameter.

If DISCONNECT=MULTSESS is specified or defaulted, MULTSESS retains control of the terminal and the MULTSESS logo, with prompts for userid and password, is displayed.

If DISCONNECT=LOGOFF is specified, MULTSESS releases control of the terminal to VTAM, or the controlling (LOGAPPL) application. This option is particularly useful for users of network monitor applications such as Network Control Interface (NCI). MULTSESS will return control to the terminal's current NCI panel, which may be a menu or the NCI logo.

Reconnecting

When the user later wishes to resume work, he simply types his userid and password at the MULTSESS logo. MULTSESS recognizes that an environment already exists for the user and automatically reconnects the user to his previous MULTSESS session. If no application sessions are active at the time of the reconnect, the user may reconnect using the same or any other terminal that he is authorized to use.

If any application sessions are active at the time of the reconnect, MULTSESS will only allow reconnection from a terminal with the same lutype and screen size as the original terminal. This ensures integrity of application sessions since the target applications may well be sensitive to screen size and will certainly be sensitive to lutype.

If required, users may be permitted to reconnect from a different terminal screen or lutype (for example to allow them to terminate their sessions and restart them on the new screen size or lutype) by using customization fix 13.

Automatic disconnect
Users may be automatically placed in disconnect status if no terminal activity occurs within a customer specified time period. This ensures security of application data (maybe up to 255 applications) should a user leave a terminal unattended.

Remote disconnect
If the REMOTE-DISCONNECT=YES startup parameter is specified, the 'remote disconnect' facility is enabled.

If a user attempts to reconnect to MULTSESS and is still connected on another terminal, the user is offered the option to remotely disconnect the old terminal, allowing reconnection on the new terminal to complete.

Other specialised options
The following MULTSESS startup options are available to meet the specialized requirements of some customers.

DISCONNECT-WITH-SESSIONS=YES|NO
If NO is specified, users are not allowed to disconnect from MULTSESS if they have any active application sessions. This effectively disables the DISCONNECT/RECONNECT command and the USER-IDLETIME startup option. Before a user may issue a disconnect or logoff command, application sessions must be terminated.

DISCONNECT-USER-CLEANUP=YES|NO
If YES is specified, a DISCONNECT command issued by a user with no active sessions is treated as a LOGOFF command. All storage and control blocks owned by the user are cleared up and freed.

A user who disconnects with active application sessions is unaffected by this option, unless all application sessions are terminated by idle-time processing before the user reconnects. When the last application session is terminated, this option becomes operative and the user is logged off from MULTSESS.

Chapter 3 - Session control

Direct application connection

Session manager

MULTSESS is a 'session manager' whose primary function is to allow a terminal user to maintain a number of application sessions concurrently from a single terminal and be able to switch efficiently between them.

A session manager achieves this primary objective by sitting logically between the terminals and the target applications, monitoring all the data flow on behalf of all the users and distributing it appropriately.

Permanent session

There are occasions when a user will never want to switch out of a session. The most common situation is:

> the user starts a session,
> performs a unit of work,
> and then exits from the application.

The user may simply be using a security or attendance system, and will therefore:

> access the system on arrival,
> register his/her presence,
> and exit.

The application may not be used again until the end of the working day.

In such instances, it is an unnecessary overhead for MULTSESS to monitor the data traffic since switching will never be required.

To address such situations, MULTSESS offers a 'Direct Application Connection' feature. When the user requests a session, the user is disconnected from MULTSESS and control of the terminal is passed to the target application using the VTAM CLSDST PASS function. The terminal communicates directly with the application as if the user had logged on to the application in the traditional way.

Defining an application for direct connection

An application may be defined as a 'connect-only' application by coding the CONNECT=YES parameter in the ADT entry that defines the application to MULTSESS.

All requests for sessions with this application will cause control of the terminal to be passed to the application using CLSDST PASS. The user issuing the request will be disconnected from MULTSESS.

Note: All application session requests within MULTSESS are processed by reference to the application symbolic name, as defined in the ADT. Thus an application may be defined twice (or more), once specifying CONNECT=NO for use by multiple-session users and again with CONNECT=YES for use by CLSDST PASS users.

Authorized use

A user is authorized to use the 'connect-only' application, in the same way as any other MULTSESS application, by including a SESSION statement specifying the application symbolic name in the user's directory entry. The directory entry for a user may authorize access to a combination of 'connect-only' and 'multi-session' applications by including appropriate SESSION statements.

Using the Session statement

With direct application connection, the vterm and script parameters are ignored since use of a virtual terminal is never required, and scripting is incompatible with CLSDST PASS processing (the application definition statements IDLETIME and BIND, and the session limit startup option are also ignored). The terminal parameter may be coded to restrict access to the application to a subset of terminals. The logmode parameter may be coded to cause the terminal to be logged on to the target application with the specified logmode name.

Note: The logmode must exist in the logmode table either by default or as defined by the MODETAB operand of the terminal LU definition (or in the IBM default table ISTINCLM). If the logmode parameter is not specified on the SESSION statement, MULTSESS will not pass a logmode name as part of the CLSDST PASS request. VTAM will establish the session using the terminal default logmode as defined or defaulted in the DLOGMOD parameter of the terminal LU definition. (Customization fix 15 allows these features to be altered).

Example 1

```
*
* Sample Application Definition table (ADT)
* defining an application as both 'connect only'
* and 'multi session'.
*
*                                          NORMAL TSO WITH CINIT DATA
APPLICATION
NODENAME = NYTSO
SYMBOLIC=MNYTSOC
BIND=TSONYO VTERM=YES
CINIT=&SYSUSER./&SYSPASS
*
*                                          IMS WITH LOGON SCRIPT
APPLICATION
NODENAME = LAIMS
SYMBOLIC=MLAIMS
VTERM=YES
SCRIPT=IMSLOGON
*
*                                          CONNECT-ONLY TSO
APPLICATION
NODENAME = NYTSO
SYMBOLIC=CNYTSO
CONNECT=YES
*
```

Example 2

```
*
*  Sample directory entries authorizing use of
*  the application defined above.
*
*  This user may use any 'multi session'
*  application.
*
USER     MULT0001  RACF  G   5
PROFILE  ????PROF
VTERM    POOLIMS
SESSION  M*
*
* This user is permitted to use CLSDST PASS for TSO and multi session with
* IMS
*
USER     CONN001  RACF  G    5
PROFILE  ???PROF
VTERM    POOLIMS
SESSION  C*
SESSION  MLAIMS
*
```

Defining a user for direct connect only

A MULTSESS user may be defined as a 'connect-only' user by specifying the CONNECT-ONLY parameter in the user's MULTSESS directory entry. The user is authorized to access only those sessions for which a session statement exists in the directory entry and which are defined with CONNECT=YES in the ADT. A request for a session with any of the applications will be processed by CLSDST PASS. The most common use of this facility is to define a group of users e.g.

```
USER      GRP*
SESSION   *
CONNECT-ONLY
```

Logon
If the user is placed in dynamic panel mode at logon time, the menu panel will list only CONNECT=YES applications from the ADT. The user is passed to any of these applications using CLSDST PASS processing.

Vterm statements
No VTERM statements need be coded for a connect only user, because virtual terminals are not required for CLSDST PASS processing.

SESSION statement parameters
Considerations for SESSION statement parameters are the same as for accessing a connect-only application, as described in the previous section.

Logoff from the target application

When a terminal which has been passed to a target application returns to MULTSESS control, either as a result of logappl processing or a subsequent VTAM logon request, the action taken depends on the specification of the CONNECT-RECONNECT startup option.

CONNECT - RECONNECT

If CONNECT-RECONNECT=YES has been specified, the terminal will be automatically reconnected to MULTSESS using the same userid as was in use when the CLSDST PASS session request was issued.

This is the recommended method when the TERMINAL-LOGON feature is used.

If CONNECT-RECONNECT=NO was specified or defaulted, the MULTSESS logo will be displayed, prompting for the entry of a userid and password. The original user may reconnect by entering the original userid, or another user may access MULTSESS by specifying his own userid. This is the recommended method when unique individual userids are used.

The Dynamic panel

MULTSESS/HPO has the power to customize the dynamic panel by using the source of the module TPEXPAN (supplied in the **PREFIX**.SOURCE library) and the 3 macros (supplied in the **PREFIX**.MACLIB), EXPAN, EXDEF and EXSCR.

With MULTSESS/HPO you can:

1. Change the value, position and colour of any of the constant characters on the screen.

   For example, the descriptions of the input fields, headings, the characters making up the box and the application status descriptions.

2. Change the length and position of input fields on the screen, or remove them completely.

   For example, remove the logmode from the header line completely, or shorten the length of the MSKEY field so that only one character may be input. Whole lines can be swapped round, so that, for example, the HOT NEWS could be moved to below the application box.

3. Define new commands that can be used in the command column of the application box.

   For example, an H to terminate a script running on that session.

The above methods of customization are described below and on the following pages.

TPEXPAN can be dynamically reloaded, so any modifications can be brought on line without restarting MULTSESS. This makes developing customized dynamic panels much quicker.

The supplied dynamic panel layout

Line 1 *information header line.*
The four elements can be moved or suppressed. The text of the headings can be changed.

Line 2 and 22 *separator lines.*
The dots can be changed to any characters or spaces.

Line 6 through 19 *dotted box around menu of applications.*
The dots can be changed to any characters or spaces.

Line 7 *header line for application menu.*
Column headers can be changed.

Line 9 through 18 *application/session status.*
The keywords can be changed.

Line 21 *control character input line.*
Text describing the input fields can be changed.

Line 24 *error message line.*
The text of error messages specific to panel build and control can be changed. These messages are not in the MULTSESS user-definable message module TPMSGS.

The macro EXDEF contains the prompts, field attributes and positioning of all the input fields on the screen. To change the constant characters, simply edit them to the required value. To change the colour or other attribute, for example, flashing or reverse video, edit the X'41' or X'42' attributes according to the following permitted PDS values:

41xx where **xx** can be as follows:

> 00 = default
> F1 = flashing
> F2 = reverse video
> F3 = underscore

42xx where **xx** can be as follows:

> 00 = default
> F1 = blue
> F2 = red
> F3 = pink
> F4 = green
> F5 = turquoise
> F6 = yellow
> F7 = neutral

To change the position of characters on the screen, change the values defined in the EXSCR macro. The two numbers represent a row and column. Change them to the values required, ensuring that any changes to the input fields correctly match up to the prompts.

The EXSCR macro
Use the EXSCR macro as previously described to move the position of any input field, change the attributes to make them the required colour etc.

To change the length of the input fields, change the filler X'00' to the required length. The length of the move instruction should then be altered in the EXPAN macro, for example, to change the move of the userid on the header line to six characters, change the instruction:

> EXUSER MVC PANUSER(-PANDEF(8,4),0(1)

> to

> EXUSER MVC PANUSER(-PANDEF(6,4),0(1)

Defining new commands for the C column of the dynamic panel
In addition to the A,S,E,T and P commands you may change or add new commands. Refer to the example in member EXPAN in the distributed source.

The A and S commands are reserved, so the supplied example only shows how the other three commands have been defined.

The format of the command is as follows.

    CL1'x',CL18'command',CL1' ',CL8,CL5

For example:

    CL1'H',CL18'TERMRUN',CL1' ',CL8,CL5

generates the following command when H is placed in the Command column against APPL1.

    TERMRUN(*11 spaces*) PFK1 (*9 spaces*)

The character defined in the CL1 gives the command letter. The command generated consists of the first 18 characters as defined in the DC statement, a space, the alias of the session placed in the command, a space and 5 further characters as defined in your DC statement.

In the supplied example (in member EXPAN) the 1 command means copy from session number 1 to this session, with the option (T on the COPY command. This will generate:

    COPY   PFK1   PFK2   (T

Notes
You may define as many commands as you like, providing you do not use letters A or S.

The label COMMANDL defines the length of 1 table entry. Additional entries should therefore be inserted after this label.

On entry to TPEXPAN, R1 points to EXIT UCTL.

On exit from TPEXPAN, R1 points to the panel address, R0 contains the length, R9 contains the first panel construction, R15 contains the line length.

Editing the EXPAN and EXDEF macros
The supplied example (in member EXPAN) creates a second panel layout in the EXDEF, and a different set of panel commands for use with this panel. To use this example rename the EXPANS1 and EXDEFS1 macros to EXPAN and EXDEF respectively and assemble member TPEXPAN1 against them. The resultant load module should be renamed TPEXPAN and placed in a relevant library for your job.

Dynamic panel build from an ACF2_{TM} database

Who should read this?

This section will be of interest to MULTSESS administrators in installations that use the ACF2$_{TM}$ security system from Computer Associates. The section describes how to customize MULTSESS in order to dynamically build an application menu panel based on the contents of an ACF2$_{TM}$ database.

The sample library loaded from the distribution tape contains members TPX07S12 and TPX08S12, sample exit source for MULTSESS exit points 7 and 8. The rest of this section describes how to implement these sample routines in a production environment.

What facilities do the exits provide?

TPX07S12 is called at logon time to:

> Validate userid, password and new password using an ACF2$_{TM}$ database.
> Prompt for and validate a new password if the old password has expired.
> Verify, using the user's ACF2 LIDREC, that the user is authorized to use MULTSESS.
> Save the user's LIDREC in storage for use by TPX08S12.

TPX08S12 uses the LIDREC saved in TPX07S12 to:

> Dynamically build an application menu containing only those applications for which the user is ACF2 authorized.
> Ensure the user does not access an unauthorized application using a SESSION command.
> Edit the output of QUERY commands to report only authorized applications.

Validating access to MULTSESS

The MULTSESS Directory of Users is the primary vehicle for exercising access control to MULTSESS. Userids entered into the MULTSESS logo panel must be matched by an entry in the directory before the logon is allowed to proceed.

Generic or masked directory entries may be specified (eg ABC* or A+B*) to reduce the number of entries required and their maintenance. However, this technique may not be suitable in all circumstances especially where userids do not conform to any predictable naming convention.

TPX07S12 will validate access to MULTSESS by testing a bit (or byte) setting in the user's LIDREC, allowing the use of general purpose directory entries and reducing directory maintenance.

To use this facility:

> Reserve a bit within the LIDREC DSECT to indicate authorization to use MULTSESS. Set this bit ON for users who ARE allowed to use MULTSESS.

> Tell the exit the offset into the LIDREC and the bit to check by coding the SECURITY parameter as part of a general purpose directory entry. This value is passed to the exit in the EXITSECR field of the standard parameter list.

> TPX07S12 requires EXITSECR to contain a halfword offset, followed by a one byte mask which will be used for a TM (Test Under Mask) instruction to check authorization.

For example, if the high-order bit at offset 201 into the LIDREC is allocated to indicate authority to use MULTSESS (on=access allowed, off=access denied), the required SECURITY parameter would be:

    SECURITY=201,X'80'

Specify EXITM in the password field of the general purpose directory of users who are to be validated in this way.

Specifying EXIT*a* as part of a directory entry, where *a* may be any character or may be omitted, will cause MULTSESS exit point 7 to be driven for logon validation. The value specified for *a* is passed to the exit in the EXITOPT field of the standard parameter list. TPX07S12 will only test the LIDREC for authority to use MULTSESS if M is specified, providing a convenient means of bypassing this type of checking if it is not required.

A sample general purpose directory where TPX07S12 is used for access validation might be:

```
USER      *EXITM G
PROFILE   GENERAL
VTERM     POOLGEN
SESSION   *
SECURITY=201,X'80'
```

Specifying SESSION * would normally mean access is allowed to any application. TPX08S12, designed to work together with TPX07S12 and described later in this newsletter, will refine the choice of applications available based on ACF2 data.

Storing MULTSESS command class in an ACF2 database
A user's MULTSESS command class is normally defined as the third parameter on a USER statement in the Directory of Users. Current releases of MULTSESS do not support the passing back of the command class from an exit call. This will be supported in a future release as a standard updatable field in the exit parameter list for exit point 7, call code 71.

If you wish to store your users' command class within ACF2 and pass it to MULTSESS at logon time, you may do so on the current release by changing TPX07S12 (as described on page 3.10).

On entry to TPX07S12 at logon time (call code 71), register 8 points to the user's in-storage copy of the MULTSESS directory entry. The user's command class is held as a single byte at offset X'14' (decimal 20) into the directory.

By saving the contents of register 8 on entry to TPX07S12, the exit can address the directory and may update it. The recommended technique is as follows:

- Instead of allocating a bit within the LIDREC to designate authorization to use MULTSESS, as described on the previous page, allocate a whole byte and store the user's command class (A through G) there.

- Specify EXITM as the password in the directory to cause TPX07S12 to invoke the validation routines described on the previous page.

- Modify TPX07S12 to save the contents of register 8 on entry.

- Specify the SECURITY parameter in the directory, as described on page 3.9, as *nnn*,X'C0' where *nnn* is the offset, in decimal, of the LIDREC byte containing the command class.

TPX07S12 will do a Test Under Mask using C0 as the mask. This will cause access validation to test true for any valid MULTSESS command class (A through G) but users having a null or blank at the specified location will be denied access to MULTSESS.

- Add code to TPX07S12 after label NOPROBLM to move the command class byte from the LIDREC to the user's in-storage directory entry - decimal 20 from register 8 as saved on entry.

TPX08S12 - Dynamic application menu build
TPX08S12 is a sample routine for use at MULTSESS exit point 8 (EXIT08) to:

- Dynamically control the list of applications which appear on a user's MULTSESS dynamic panel, based on the contents of the user's ACF2 LIDREC.

- Validate, at session initiation time, that the user is authorized to use the requested application. This prevents users requesting sessions with an application not listed on their menu by typing a SESSION command in the panel command input area.

- Edit the output produced by QUERY commands so that information is only provided about applications and sessions the user is authorized to access.

TPX08S12 is designed for use in conjunction with TPX07S12 and uses the in-storage copy of the user's LIDREC obtained by TPX07S12 at logon (or reconnect) time. Enabling and using TPX08S12 without also having TPX07S12 enabled will cause unpredictable results and is definitely not recommended!

If exit point 8 is enabled, the exit is called as each line is about to be placed into the application menu area (the dotted box) of a user's MULTSESS dynamic panel. The exit may accept a line by setting a return code of zero or reject it by setting a return code of 4. For each application line passed to TPX08S12 the exit examines the user's LIDREC and tests the bit pattern at the offset specified in the SECURITY parameter in the ADT entry for the application. The security data is available to the exit in the EXITSECR field of the parameter list passed in register 1.

To use the dynamic menu build facility:

- Reserve a bit within the LIDREC DSECT for each of your applications. Set this bit ON for users who ARE allowed to use the application.

- Tell the exit the offset into the LIDREC and the bit to check by coding the SECURITY parameter as part of the definition of each application in the MULTSESS Application Definition Table (ADT). This value is passed to the exit in the EXITSECR field of the standard parameter list.

TPX08S12 requires EXITSECR to contain a halfword offset, followed by a one byte mask which will be used for a TM (Test Under Mask) instruction to check authorization.

For example, if the low-order bit at offset 202 into the LIDREC is allocated to indicate authority to use TSO, the ADT entry for TSO would be:

```
APPLICATION
NODENAME=A01TSO
SYMBOLIC=TSO
SECURITY=202,X'01'
```

If the relevant bit is on in a user's LIDREC, TSO would be included on the user's menu panel and sessions would be allowed. If the low-order bit of the byte at offset 202 into the user's LIDREC was off, TSO would not be listed on the user's menu and any attempt to start a session to TSO, for instance by typing a SESSION command, would be disallowed. If the users issued a QUERY * command, TSO would not be listed as an available application.

Invoking the supplied exits
The sample exits TPX07S12 and TPX08S12 are supplied in assembler source form in the sample library loaded from the product distribution tape.

For any exit to be used, it must be present in the MULTSESS steplib library and be called TPEXIT*nn*, where *nn* is the exit point number to which the routine relates.

The supplied sample and load libraries contain dummy exits TPEXITnn for each supported exit point. These dummies simply write a message to the MULTSESS log indicating that the exit has been called, but take no further action.

To use TPX07S12 and TPX08S12:

- Update your Directory of Users and Application Definition Table.

- Rename sample library members TPEXIT07 and TPEXIT08 to any other name.

- Rename sample library member TPX07S12 to TPEXIT07 and rename TPX08S12 to TPEXIT08.

- Assemble and linkedit the newly named TPEXIT07 and TPEXIT08 into your MULTSESS steplib library. Sample library member ASMSAMP contains JCL to do this. Before running the jobstream, ensure that the SYSLIB DD for the assembly step includes the library containing your ACF2 macros.

- Update the EXIT= parameter in your MULTSESS startup options to enable exit points 7 and 8 at startup:

  EXIT=78

- Start MULTSESS.

Dynamic panel build from a RACF_{TM} database

Who should read this?
This section will be of interest to MULTSESS administrators in installations that also use the RACF$_{TM}$ security system from IBM.

The section describes how to customize MULTSESS to dynamically build an application menu panel based on the contents of a RACF$_{TM}$ database.

The sample library loaded from the distribution tape contains sample exit source for MULTSESS exit points 7 and 8. Two distinct pairs of exits are supplied to provide dynamic menu build based either on bit or byte settings in the RACF INSTDATA area of the user template, or on the application groups the user is connected to.

How do the exits use RACF INSTDATA?
TPX07S15 is called at logon time to:

- Validate userid, password and new password using a RACF$_{TM}$ database.
- Prompt for and validate a new password if the old password has expired.
- Check, using the user's RACF INSTDATA, that the user may use MULTSESS.
- Save the user's INSTDATA in storage for use by TPX08S15.

TPX08S15 uses the INSTDATA area saved in TPX07S15 to:

- Dynamically build an application menu containing only those applications for which the user is RACF authorized.
- Ensure the user does not access an unauthorized application using a SESSION command.
- Edit the output of QUERY commands to report only authorized applications.

How do the exits use RACF application GROUPS?
TPX07S16 is called at logon time to:

- Validate userid, password and new password using an RACF$_{TM}$ database.
- Prompt for and validate a new password if the old password has expired.
- Check that the user is connected to the MULTSESS group, indicating that the user may use MULTSESS.
- Save the list of RACF application groups to which the user is connected, for use by TPX08S16.

TPX08S16 uses the list of RACF application groups saved in TPX07S16 to:

- Dynamically build an application menu containing only those applications for which the user is RACF authorized.
- Ensure the user does not access an unauthorized application using a SESSION command.
- Edit the output of QUERY commands to report only authorized applications.

TPX07S15 - INSTDATA logon exit

TPX07S15 is used at exit point 7 (EXIT07) to validate access to MULTSESS.

Although this exit is described as a 'sample', and the source is included in the sample library loaded from the distribution tape, the exit is fully developed and tested and may be used as supplied in a production environment. This does not, of course, preclude you from modifying or enhancing the supplied source to meet any installation-specific requirements. However, the rest of this section describes the routine as supplied and assumes that it is to be implemented without user modifications.

TPX07S15 provides the following functions.

At initial logon to MULTSESS (exit call code 71):

- Validate userid and password (and new password if supplied) against the RACF database.
- If RACF indicates that the password has expired and a new password was not entered, prompt for new password.
- Obtain the user's RACF INSTDATA and hold it in getmained storage.

The address of the gotten area is stored in the EXITUCTL field of the MULTSESS exit parameter list. This allows the in-storage INSTDATA to be addressed by all other MULTSESS exit calls.

Specifically, TPX08S15 will reference this area when building the user's application menu panel, but the in-storage INSTDATA is available to any other exit routines you may choose to implement.

- Check that the user is allowed to use MULTSESS. The use of this feature is more fully described in *Validating access to MULTSESS using INSTDATA* on page 3.14.

At reconnection to MULTSESS:

- The exit is driven with call code 71 to validate userid and password as described above.
- The exit is then redriven with call code 72 which frees the in-storage INSTDATA, obtained when the user initially logged on and replaces it with the latest INSTDATA from the RACF database.

At disconnect time (exit call code 73)

- No action.

At logoff time (exit call code 74)

- Release storage used for the INSTDATA.

Validating access to MULTSESS using INSTDATA

The MULTSESS Directory of Users is the primary vehicle for exercising access control to MULTSESS. Userids entered into the MULTSESS logo panel must be matched by an entry in the directory before the logon is allowed to proceed.

Generic or masked directory entries may be specified (e.g. ABC* or A+B*) to reduce the number of entries required and the maintenance of these entries. However, this technique may not be suitable in all circumstances especially where userids do not conform to any predictable naming convention.

TPX07S15 will validate access to MULTSESS by testing a bit (or byte) setting in the user's RACF INSTDATA area, allowing the use of general purpose directory entries and reducing directory maintenance.

To use this facility:

- Reserve a bit within the INSTDATA area to indicate authorization to use MULTSESS. Set this bit on for users who are allowed to use MULTSESS.

- Tell the exit the offset into the INSTDATA and the bit to check by coding the SECURITY parameter as part of a general purpose directory entry. This value is passed to the exit in the EXITSECR field of the standard parameter list.

TPX07S15 requires EXITSECR to contain a halfword offset, followed by a one byte mask that will be used for a TM (Test Under Mask) instruction to check authorization.

For example, if the high-order bit at offset 201 into the INSTDATA is allocated to indicate authority to use MULTSESS (on=access allowed, off=access denied), the required SECURITY parameter would be:

        SECURITY=201,X'80'

- Specify EXITM in the password field of the general purpose directory of users who are to be validated in this way.

Specifying EXIT*a* as part of a directory entry, where *a* may be any character (or may be omitted) will cause MULTSESS exit point 7 to be driven for logon validation. The value specified for *a* is passed to the exit in the EXITOPT field of the standard parameter list. TPX07S15 will only test the INSTDATA for authority to use MULTSESS if M is specified, providing a convenient means of bypassing this type of checking if it is not required.

A sample general purpose directory where TPX07S12 is used for access validation is:

```
USER      *          EXITM  G
PROFILE  GENERAL
VTERM    POOLGEN
SESSION  *
SECURITY=201,X'80'
```

Specifying SESSION * would normally mean access is allowed to any application. TPX08S15, designed to work together with TPX07S15 and described later in this section, will refine the choice of applications available based on RACF data.

Storing MULTSESS command class as RACF INSTDATA

A user's MULTSESS command class is normally defined as the third parameter on a USER statement in the Directory of Users. Current releases of MULTSESS do not support the passing back of the command class from an exit call. This will be supported in a future release as a standard updatable field in the exit parameter list for exit point 7, call code 71.

If you wish to store your users' command class within RACF and pass it to MULTSESS at logon time, you may do so on the current release by changing TPX07S15 as described below.

On entry to TPX07S15 at logon time (call code 71), register 8 points to the user's in-storage copy of the MULTSESS directory entry. The user's command class is held as a single byte at offset X'14' (decimal 20) into the directory.

By saving the contents of register 8 on entry to TPX07S15, the exit can address the directory and may update it. The recommended technique is as follows:

- Instead of allocating a bit within the INSTDATA to designate authorization to use MULTSESS, as described on the previous page, allocate a whole byte and store the user's command class (A through G) there.

- Specify EXITM as the password in the directory to cause TPX07S15 to invoke the validation routines described on the previous page.

- Modify TPX07S15 to save the contents of register 8 on entry.

- Specify the SECURITY parameter in the directory, as described on the previous page, as *nnn*,X'C0' where *nnn* is the offset, in decimal, of the INSTDATA byte containing the command class.

TPX07S15 will do a Test Under Mask using C0 as the mask. This will cause access validation to test TRUE for any valid MULTSESS command class (A through G), but users having a null or blank at the specified location will be denied access to MULTSESS.

- Add code to TPX07S15 after label SETRACFW to move the command class byte from the INSTDATA to the user's in-storage directory entry - decimal 20 from register 8 as saved on entry.

Dynamic application menu build using RACF INSTDATA
TPX08S15 is a sample routine for use at MULTSESS exit point 8 (EXIT08) to:

- Dynamically control the list of applications which appear on a user's MULTSESS dynamic panel, based on the contents of the user's RACF INSTDATA.

- Check at session initiation time, that the user is authorized to use the requested application. This prevents users requesting sessions with an application not listed on their menu by typing a SESSION command in the panel command input area.

- Edit the output produced by QUERY commands so that information is only provided about applications and sessions that the user is authorized to access.

TPX08S15 is designed for use in conjunction with TPX07S15 and uses the in-storage copy of the user's INSTDATA obtained by TPX07S15 at logon (or reconnect) time.

Note: Enabling and using TPX08S15 without also having TPX07S15 enabled will cause unpredictable results and is definitely **not** recommended!

If exit point 8 is enabled, the exit is called as each line is about to be placed into the application menu area (the dotted box) of a user's MULTSESS dynamic panel. The exit may accept a line by setting a return code of zero or reject it by setting a return code of 4. For each application line passed to TPX08S15 the exit examines the user's INSTDATA and tests the bit pattern at the offset specified in the SECURITY parameter in the ADT entry for the application. The security data is available to the exit in the EXITSECR field of the parameter list passed in R1.

To use the dynamic menu build facility:

- Reserve a bit within the INSTDATA area for each of your applications. Set this bit on for users who are allowed to use the application.

- Tell the exit the offset into the INSTDATA and the bit to check by coding the SECURITY parameter as part of the definition of each application in the MULTSESS Application Definition Table (ADT). This value is passed to the exit in the EXITSECR field of the standard parameter list.

TPX08S15 requires EXITSECR to contain a halfword offset, followed by a one byte mask that will be used for a TM (Test Under Mask) instruction to check authorization.

For example, if the low-order bit at offset 202 into the INSTDATA is allocated to indicate authority to use TSO, the ADT entry for TSO would be:

```
APPLICATION
NODENAME=A01TSO
SYMBOLIC=TSO
SECURITY=202,X'01'
```

If the relevant bit is on in a user's INSTDATA, TSO would be included on the user's menu panel and sessions would be allowed. If the low-order bit of the byte at offset 202 into the user's LIDREC was off, TSO would not be listed on the user's menu and any attempt to start a session to TSO, for instance by typing a SESSION command, would be disallowed. If the users issued a QUERY * command, TSO would not be listed as an available application.

To include an application unconditionally on the menu of all users whose MULTSESS directory entry allows access to the application, code SECURITY=C ' ALLOW '.

TPX07S16 - application GROUPS logon exit
TPX07S16 is used at exit point 7 (EXIT07) to validate access to MULTSESS.

Although this exit is described as a 'sample', and the source is included in the sample library loaded from the distribution tape, the exit is fully developed and tested and may be used as supplied in a production environment. This does not, of course, preclude you from modifying or enhancing the supplied source to meet any installation-specific requirements. However, the rest of this section describes the routine as supplied and assumes that it is to be implemented without user modifications.

TPX07S16 provides the following functions.

At initial logon to MULTSESS (exit call code 71):

- Check userid and password (and new password if supplied) against the RACF database
- If RACF indicates that the password has expired, and a new password was not entered, prompt for new password.
- Obtain a list of RACF application groups to which the user is connected and hold it in getmained storage.

The address of the gotten area is stored in the EXITUCTL field of the MULTSESS exit parameter list. This allows the in-storage group list to be addressed by all other MULTSESS exit calls.

Specifically, TPX08S16 will reference this area when building the user's application menu panel, but the in-storage group list is available to any other exit routines you may choose to implement.

- Check that the user is allowed to use MULTSESS. The use of this feature is more fully described in *Validating access to MULTSESS using GROUPS* on page 3.18.

At reconnection to MULTSESS:

- The exit is driven with call code 71 to validate userid and password as described above.
- The exit is then redriven with call code 72 which frees the in-storage list of application groups, obtained when the user initially logged on, and replaces it with the latest list of groups from the RACF database.

At disconnect time (exit call code 73)

- No action

At logoff time (exit call code 74)

- Release storage used for the application groups list.

Validating access to MULTSESS using GROUPS

The MULTSESS Directory of Users is the primary vehicle for exercising access control to MULTSESS. Userids entered into the MULTSESS logo panel must be matched by an entry in the directory before the logon is allowed to proceed.

Generic or masked directory entries may be specified (e.g. ABC* or A+B*) to reduce the number of entries required and their maintenance. However, this technique may not be suitable in all circumstances especially where userids do not conform to any predictable naming convention.

By defining MULTSESS itself as an application GROUP to RACF, TPX07S16 can validate access to MULTSESS by checking that a user logging on is connected to the MULTSESS GROUP, allowing the use of general purpose directory entries and reducing directory maintenance.

To use this facility:

- Define MULTSESS to RACF as a group and connect all authorized users to the group.

- Pass the MULTSESS group name to the exit by coding it as the SECURITY parameter as part of a general purpose directory entry. This value is passed to the exit in the EXITSECR field of the standard parameter list.

- Specify EXITM in the password field of the general purpose directory of users who are to be validated in this way.

Specifying EXIT*a* as part of a directory entry, where *a* may be any character or may be omitted will cause MULTSESS exit point 7 to be driven for logon validation. The value specified for *a* is passed to the exit in the EXITOPT field of the standard parameter list. TPX07S16 will only test for GROUP authority to use MULTSESS if M is specified, providing a convenient means of bypassing this type of checking if it is not required.

A sample general purpose directory where TPX07S12 is used for access validation might be:

```
USER       *              EXITM    G
PROFILE   GENERAL
VTERM     POOLGEN
SESSION   *
SECURITY=C'MULTGRP'
```

Specifying SESSION * would normally mean access is allowed to any application. TPX08S16, designed to work together with TPX07S16 and described later in this section, will refine the choice of applications available based on RACF data.

Dynamic application menu build using application GROUPS
TPX08S16 is a sample routine for use at MULTSESS exit point 8 (EXIT08) to:

- Dynamically control the list of applications which appear on a user's MULTSESS dynamic panel, based on the list of RACF application groups to which the user is connected.

- Check, at session initiation time, that the user is authorized to use the requested application. This prevents users requesting sessions with an application not listed on their menu by typing a SESSION command in the panel command input area.

- Edit the output produced by QUERY commands so that information is only provided about applications and sessions the user is authorized to access.

TPX08S16 is designed for use in conjunction with TPX07S16 and uses the in-storage application group list obtained by TPX07S16 at logon (or reconnect) time.

Note: Enabling and using TPX08S16 without also having TPX07S16 enabled will cause unpredictable results and is definitely **not** recommended!

If exit point 8 is enabled, the exit is called as each line is about to be placed into the application menu area (the dotted box) of a user's MULTSESS dynamic panel. The exit may accept a line by setting a return code of zero or reject it by setting a return code of 4. For each application line passed to TPX08S16 the exit searches the user's RACF group list for the group name specified in the SECURITY parameter in the ADT entry for the application. The security data is available to the exit in the EXITSECR field of the parameter list passed in R1.

To use the dynamic menu build facility:

- Define a RACF application group for each of your applications and logically connect users to the application groups they are allowed to access.

- Pass the group name of each application to the exit by coding the SECURITY parameter as part of the definition of each application in the MULTSESS Application Definition Table (ADT). This value is passed to the exit in the EXITSECR field of the standard parameter list.

If the group name is the same as the application symbolic name, as specified in the SYMBOLIC= parameter of the ADT, the SECURITY parameter may be omitted.

To include an application unconditionally on the menu of all users whose MULTSESS directory entry allows access to the application, code SECURITY=C ' ALLOW '

```
Examples:        APPLICATION
                 NODENAME=A01TSO
                 SYMBOLIC=TSO
                 SECURITY=C'TSOA'
                 APPLICATION
                 NODENAME=A01IMS
                 SYMBOLIC=PRODIMS
                 APPLICATION
                 NODENAME=A01EM
                 SYMBOLIC=EMAIL
                 SECURITY=C'ALLOW'
```

RACF messages ICH70001I and ICH70002I
Your RACF may be set up to supply users with one or both of the following messages at logon time:

> ICH70001I *userid* LAST ACCESS AT *hh:mm:ss* ON *date*
> ICH70002I YOUR PASSWORD WILL EXPIRE IN *nnn* DAYS

A routine, TPEXITRA, is supplied to generate these same messages to MULTSESS users at logon time. TPEXITRA is invoked from TPX07S15 and TPX07S16.

The routine is supplied in source and load module form. You may update TPEXITRA to change the format of the messages.

You may update TPX07S*nn* to bypass the invocation of the routine altogether to suppress the messages. To do this, remove all instructions between labels CODE71 and SETIBUFA. (Do NOT remove the labels).

Invoking the supplied exits
All sample exits described in this section are supplied in assembler source form in the sample library loaded from the product distribution tape.

For any exit to be used, it must be present in the MULTSESS steplib library and be called TPEXIT*nn*, where *nn* is the exit point number to which the routine relates.

The supplied sample and load libraries contain dummy exits TPEXIT*nn* for each supported exit point. These dummies simply write a message to the MULTSESS log indicating that the exit has been called, but take no further action.

To use any of the supplied samples:

- Update your Directory of Users and Application Definition Table as described earlier in this section.

- Rename sample library members TPEXIT07 and TPEXIT08 to any other name.

- Rename the sample source members you wish to use as TPEXIT*nn*:

> TPX07S15 →TPEXIT07
> TPX08S15 →TPEXIT08
>
> or
>
> TPX07S16 →TPEXIT07
> TPX08S16 →TPEXIT08

Remember that the exits are designed for use in matched pairs. The sequence number (the digits following the **S**) indicate the pairings. NEVER use one from one sequence pair with one from another.

- Assemble and linkedit the newly named TPEXIT07 and TPEXIT08 into your MULTSESS steplib library. Sample library member ASMSAMP contains JCL to do this.

Before assembling, ensure that:

- The SYSLIB DD for the assembly step includes the library containing your RACF macros.
- The SYSLIB for the link-edit step includes your MULTSESS STEPLIB library. This allows the linkage editor to automatically resolve the external reference to the TPEXITRA module.

Before running MULTSESS

- Update the EXIT=parameter in your MULTSESS startup options to enable exit points 7 and 8 at startup:

  EXIT=78

Changing dynamic panel session alias names

Why should the session alias name, created automatically by the dynamic panel when a session is started, be changed?
The MULTSESS session name created is PFK*nn*, where *nn* is the number appearing in the ID column in the application box for IDs up to 24; that is, session <PFK11> with application ID11 will be started by hitting <PFK11>. This is a feature of previous releases that has been retained for compatibility.

If the PF Keys have been set up by the user, or a PANEL PFKSET command has been issued, it does not necessarily follow that <PFK3> will have been specified to start a session with the application whose ID number is 3. Thus the situation could arise, for example, where <PFK5> might start a session with application ID11, resulting in session alias <PFK11>.

If a session alias of PFK*nn* does not correspond to the PF Key that starts the session, this may lead to confusion.

What does the supplied zap do?
The supplied zap (member TNL27004 in the supplied fixlist) causes the session alias created by the Dynamic panel to be ID.*nn*, where *nn* is the ID number of the application. In this way, the session alias cannot be misleading. The zap as supplied changes the alias name to ID.*nn*, but this could be any required three (non-space) characters.

How is the zap applied?
The zap can be applied to the MULTSESS load library by using the IBM utility AMASPZAP.

Sample JCL to run AMASPZAP is provided in Example three in *Appendix A - Sample zaps.*

SIMLOGON support

This feature will be of particular interest where MULTSESS is maintaining sessions to applications which themselves issue CLSDST PASS to pass control of the terminal to another application and queue a SIMLOGON to regain control of the terminal at logoff from the target application.

Typical applications include NCI and INFO/NET.

MULTSESS response to SIMLOGON requests

MULTSESS will respond to SIMLOGON requests queued to a virtual terminal. When an application session terminates, a queued SIMLOGON will be accepted and the session will revert to the application named in the SIMLOGON (usually the issuer of the SIMLOGON).

This enables MULTSESS to be used in conjunction with applications such as INFO/NET with control being returned to the next application level after a target session is terminated.

When the user terminates the session with the target application, either by normal application logoff procedures or by entering a MULTSESS TERMSESS command, the queued SIMLOGON takes effect and the session reverts to the next lower level application, in this case INFO/NET. The MULTSESS menu shows the session as active.

When the user terminates this session, the queued SIMLOGON to NCI is actioned and the session reverts to NCI. The MULTSESS menu shows the session as active.

When the last level of session is terminated (the NCI session in the example on the next page), control returns to MULTSESS. The MULTSESS menu shows the session as ended.

Example
The example on the next page shows NCI as an intermediate node. NCI is included as a demonstration of multi-level queued SIMLOGON support. The use of NCI is not mandatory. MULTSESS supports sessions directly with INFO/NET.

For efficiency, NCI only issues SIMLOGON to regain control of the sessions when explicitly requested to do so by use of the CONNECTR verb.

Terminals LOGAPPL'd to NCI should use CONNECT allowing the LOGAPPL to regain control of the session. (LOGAPPL uses approximately 300 bytes of CSA; SIMLOGON requires approximately 2K of CSA).

```
                  SESSION NCI PFK1
                         │
                         ▼
        ┌─────────────────┐   REQSESS   ┌─────────────────┐
        │    MULTSESS     │ ──────────▶ │       NCI       │
        └─────────────────┘             └─────────────────┘


        ┌─────────────────┐             ┌─────────────────┐  CLSDST PASS
        │    MULTSESS     │ ─────────── │       NCI       │ ╮
        └─────────────────┘             └─────────────────┘  ╲
                  ▲                           ╱                 ▼
                   ╲                         ╱          ┌─────────────────┐
              SIMLOGON TO NCI                           │    INFO/NET     │
                                                        └─────────────────┘


        ┌─────────────────┐             ┌─────────────────┐  CLSDST PASS
        │    MULTSESS     │ ─────────── │       NCI       │ ╮
        └─────────────────┘             └─────────────────┘  ╲
                  ▲                                            ▼
                   ╲                                  ┌─────────────────┐
         SIMLOGON TO INFO/NET  ◀──────────────────    │    INFO/NET     │
           SIMLOGON TO NCI                             └─────────────────┘
                                                               │
                                                   CLSDST PASS │
                                                               ▼
                                                      ┌─────────────────┐
                                                      │ Target Application │
                                                      └─────────────────┘
```
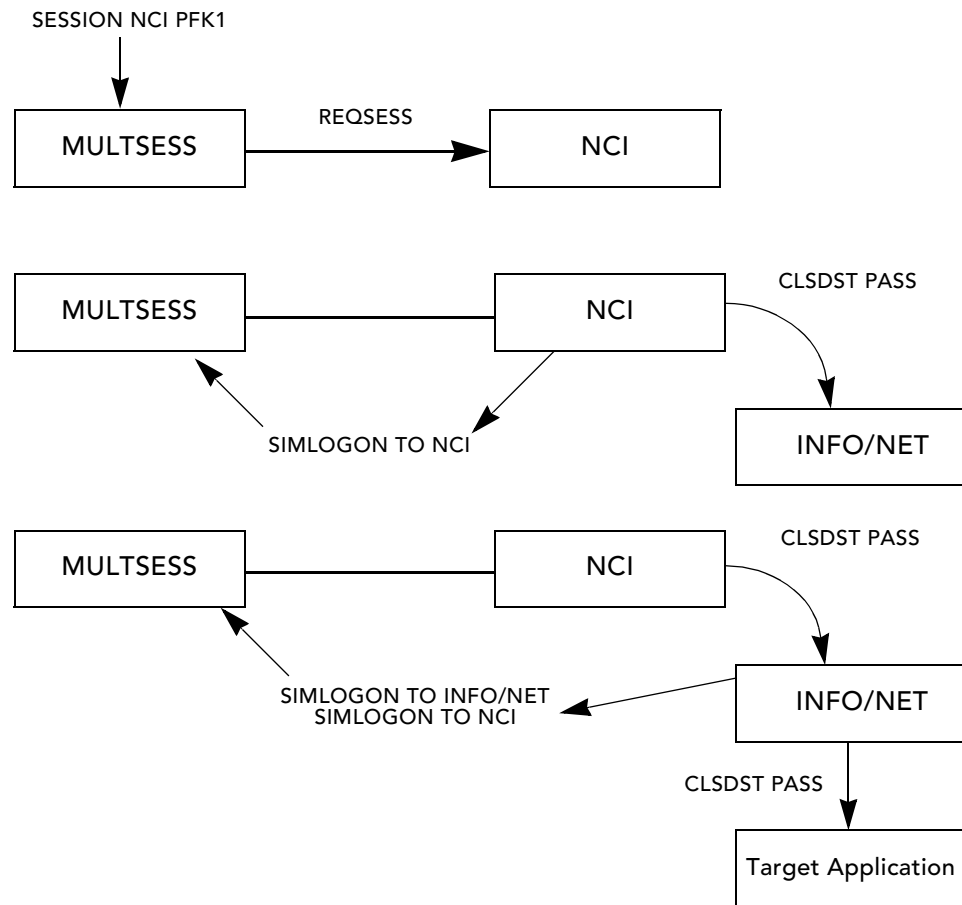
The support described was designed for use with INFO/NET (and similar value-added network applications), as described on the previous page, and to support multi-site customers using NCI where the following scenario applies:

> For security and control, all connections to applications at remote sites is through NCI. The MULTSESS user at the central site is automatically connected to NCI at each remote site when logging on to MULTSESS in the morning, and periodically uses other applications at each site. See diagram on the next page.

Provided NCI issued CONNECTR to pass control to CICS, the session will revert to NCI when the CICS session ends.

The MULTSESS user therefore remains permanently connected to each site. When he/she switches to the session for that site, the user will be connected to the target application session (if one has been activated), or to that site's NCI, in order to access either the site's information services or the site menu of applications so as to select a new application.

Note: VTERMs must be defined as Programmable Logical Units (PLUs) to INFO/NET.

Implementing SIMLOGON support

A SIMLOGON parameter in the Application Definition Table (ADT) indicates that SIMLOGON support is required for the session. Typically INFO/NET, NCI and other similar applications are defined to include the new parameter:

```
APPLICATION
NODENAME=A01INFO
VTERM=YES
SYMBOLIC=INFONET
SIMLOGON=YES
```

The default for the SIMLOGON parameter is NO, thus necessitating no changes to existing definitions for applications that do not require this support.

Terminating SIMLOGON type sessions

Normal session termination (TERMSESS *alias* or entering T against the session on the dynamic panel) will cause the session to revert to the next lower level. Each succeeding TERMSESS will drop back one more level until no levels are left, at which point MULTSESS will report the session as ended, assuming the alias on the original SESSION command was PFK1.

To allow immediate termination of all levels of session, the TERMSESS command is enhanced to include an additional operand:

TERMSESS *alias* ALL

Dynamic panel mode users may enter an E command against the application.
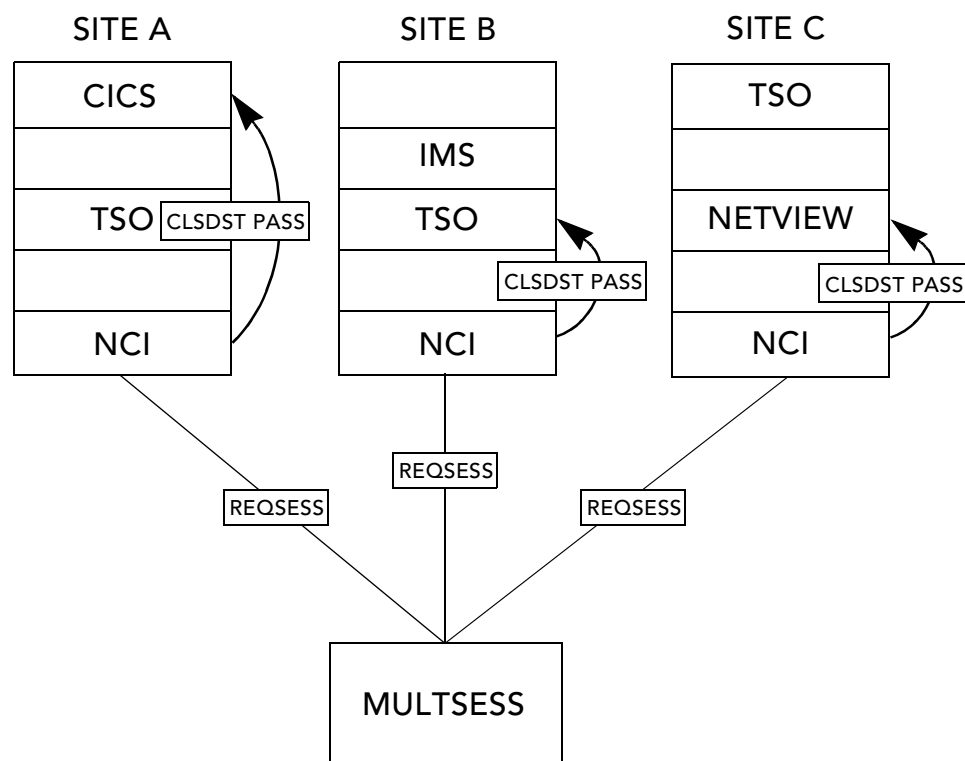
This page intentionally left blank

Chapter 4 - Miscellaneous MULTSESS/HPO features

Modifying MULTSESS/HPO command classes

Who should read this section?
Users who find that their current setting of command class authorities do not agree with their installation's requirements. For further information see *Appendix A - Sample zaps.*

How does MULTSESS control command usage?
Each user is assigned a command authority by his entry in the MULTSESS Directory of Users. Please refer to the description of the USER statement in the MULTSESS/HPO User Installation Manual in *Chapter 4 - Defining users to MULTSESS/HPO* (page 4.8) for further details.

Each MULTSESS major command (e.g. SESSION, DEFINE) and subcommand (e.g. SET SESSCHAR, SET MAXUSERS) is assigned a command class. Commands may only be issued by users of an equal or higher command authority. Valid command authorities are A (X'C1') through G (X'C7'). A is the highest authority and G the lowest.

How is the class of a MULTSESS major command changed?
The command class of each major command is defined in load module TPECMD. Command classes may be modified using the IBM utility AMASPZAP to update the appropriate offset in TPECMD (refer to Example two in *Appendix A - Sample zaps -* this example is member TNL27002 in the distributed fixlist).

Module TPECMD may not be reloaded using the LOAD command. After applying the zap, MULTSESS must be stopped and restarted to enable the new command classes.

How is the class of a MULTSESS subcommand changed?
The command class of each subcommand is defined in the load module associated with the major command. Subcommand classes may be modified using the IBM AMASPZAP utility to update the appropriate module.

The new subcommand classes may be brought into use by loading the updated modules using the LOAD command, or by stopping and restarting MULTSESS/HPO.

How is a command or subcommand disabled?
By setting the class of the command to a value less than A (X'C1')

What else is there to be aware of?
HELP members should be updated so that the correct information is displayed when a HELP command is issued. Please refer to *Chapter 7 - Help information* in the MULTSESS/HPO Technical Reference Manual for more details.

Certain commands may be generated internally on behalf of the user. Therefore, great care must be taken when changing authority. The following commands may be generated internally:

> DISCONN
> LOGOFF
> MORE
> PROFILE
> SESSION
> TERMSESS

For certain commands (e.g. LOGON, LOGOFF, PRINT, SESSION) it may be preferable and more flexible to implement modifications using user exit routines.

To enable use of the subcommand, the class of its associated major command must be set high enough to allow the user to enter the command. For example, if the RESET subcommand of the ATPCMD command is set to class G, but the ATPCMD major command is class F or higher, a class G user could not issue the ATPCMD RESET command.

Modifying the class of major commands

Module to zap: **TPECMD**

Command	Offset	Class	Command	Offset	Class
*	0015	G(C7)	MSGAPP	01CD	C(C3)
ATPCMD	0029	B(C2)	PANEL	01E1	G(C7)
ATPDIR	003D	C(C3)	PLOAD	01F5	C(C3)
ATPVAR	0051	G(C7)	PRINT	0209	G(C7)
ATTN	0065	G(C7)	PROFILE	021D	G(C7)
CONSOLE	0079	B(C2)	QUERY	0231	G(C7)
COPY	008D	A(C1)	RESPONSE	0245	G(C7)
DEFINE	00A1	C(C3)	RUN	0259	G(C7)
DIRECT	00B5	C(C3)	SESSION	026D	G(C7)
DISCONN	00C9	G(C7)	SET	0281	G(C7)
DISPLAY	00DD	C(C3)	STACK	0295	G(C7)
ECHO	00F1	G(C7)	START	02A9	G(C3)
EXIT	0105	A(C1)	STOP	02BD	C(C3)
FIX	0119	A(C1)	TERMCOND	02D1	G(C7)
FORCE	012D	B(C2)	TERMRUN	02E5	G(C7)
HELP (see below)	0141	G(C7)	TERMSESS	02F9	G(C7)
IMAGE	0155	G(C7)	TEST	030D	G(C7)
LLOAD	0169	C(C3)	TPTRACE	0321	A(C1)
LOGOFF	017D	G(C7)	VERSION	0335	A(C1)
LOGON	0191	G(C7)	VPOOL	0349	C(C3)
MESSAGE	01A5	G(C7)	VTERM	035D	G(C7)
MORE	01B9	G(C7)	WAIT	0371	G(C7)

HELP command - offset 0142 in TPECMD indicates whether the command can be used before logon (by the use of PFK1 from the logo screen). As supplied, this is HEX 00 (enabled), changing it to hex 10 disables it.

Sample ZAP to amend major command classes

```
//JOBNAME   JOB       (ACCOUNT.CODE,),'NAME',CLASS=A,MSGCLASS=X
//ZAP       EXEC      PGM=AMASPZAP,PARM=IGNIDRFULL
//SYSLIB    DD        DSN=your.multsess.loadlib,DISP=SHR
//SYSOUT    DD        SYSOUT=*
//SYSIN     DD        *

NAME TPECMD
VER 003D   C3         ATPDIR was class C
VER 01CD   C3         MSGAPP was class C
VER 0245   C7         RESPONSE was class G
REP 003D   C2         MSGAPP now class D
REP 0245   C0         RESPONSE now disabled
IDRDATA USER001
```

In this example, the ATPDIR command is changed to class B and the MSGAPP command to class B. The RESPONSE command is disabled by setting its class to X'C0' (i.e. less than A).

Modifying the class of subcommands

ATPCMD command

Module to zap: **TPATPCMD**

Subcommand	Offset	Class	Subcommand	Offset	Class
ABEND	0535	B(C2)	TRACE	0549	B(C2)
DISPLAY	0571	G(C7)	TRACE ALL	05B1	B(C2)
RESET	055D	G(C7)	TRACE OFF	059D	B(C2)
SHUTDOWN	0521	B(C2)	TRACE ON	0589	B(C2)

ATPVAR command

Module to zap: **TPATPVAR**

Subcommand	Offset	Class	Subcommand	Offset	Class
DELETE	07E5	G(C7)	SET	07D1	G(C7)
QUERY	07F9	G(C7)			

DISCONN command

Module to zap: **TPDISCON**

Subcommand	Offset	Class
userid	0CEF	C(C3)

DISPLAY command

Module to zap: **TPDISPLA**

Subcommand	Offset	Class	Subcommand	Offset	Class
PANEL	05B5	C(C3)	VPOOLS	05C9	C(C3)

EXIT command

Module to zap: **TPEXIT**

Subcommand	Offset	Class	Subcommand	Offset	Class
ENABLE	04BD	A(C1)	QUERY	04E5	A(C1)
DISABLE	04D1	A(C1)			

IMAGE command

Module to zap: **TPIMAGE**

Subcommand	Offset	Class	Subcommand	Offset	Class
DELETE	1049	G(C7)	QUERY	1021	G(C7)
GET	105D	C(C3)	SEND	100D	G(C7)
OFF	0FF9	G(C7)	VIEW	1035	G(C7)
ON	0FE5	G(C7)			

MESSAGE command

Module to zap: **TPMESSAG**

Subcommand	Offset	Class
ALL	0685	C(C3)

PANEL command

Module to zap: **TPPANEL**

Subcommand	Offset	Class	Subcommand	Offset	Class
ON EXIT	1439	G(C7)	MSGON	1395	G(C7)
ON NOMSG	13FD	G(C7)	MSGOFF	13A9	G(C7)
ON NOEXIT	144D	G(C7)	MSGSON	13BD	G(C7)
ON NO PFK	1425	G(C7)	MSGSOFF	13D1	G(C7)
ON PFK	1411	G(C7)	ON	1355	G(C7)
ON UPDATE	1461	G(C7)	OFF	1369	G(C7)
ON NOUPDATE	1475	G(C7)	PFKSET	137D	G(C7)
ON MSG	13E9				

PLOAD command

Module to zap: **TPPLOAD**

Subcommand	Offset	Class
ALL	076D	C(C3)

PROFILE command

Module to zap: **TPPROFIL**

Subcommand	Offset	Class	Subcommand	Offset	Class
EXECUTE	0539	G(C7)	LIST	054D	G(C7)

QUERY command

Module to zap: **TPQUERY**

Subcommand	Offset	Class	Subcommand	Offset	Class
CONSESS	180D	G(C7)	MAXUSERS	1821	B(C2)
NAMES	1835	G(C7)	NETWORK	1849	B(C2)
PFK	185D	G(C7)	PFK1	1871	G(C7)
PFK2	1885	G(C7)	PFK3	1899	G(C7)
PFK4	18AD	G(C7)	PFK5	18C1	G(C7)
PFK6	18D5	G(C7)	PFK7	18E9	G(C7)
PFK8	18FD	G(C7)	PFK9	1911	G(C7)
PFK10	1925	G(C7)	PFK11	1939	G(C7)
PFK12	194D	G(C7)	PFK13	1961	G(C7)
PFK14	1975	G(C7)	PFK15	1989	G(C7)
PFK16	199D	G(C7)	PFK17	19B1	G(C7)
PFK18	19C5	G(C7)	PFK19	19D9	G(C7)
PFK20	19ED	G(C7)	PFK21	1A01	G(C7)
PFK22	1A15	G(C7)	PFK23	1A29	G(C7)
PFK24	1A3D	G(C7)	SESSCHAR	1A51	G(C7)
MSKEY	1A65	G(C7)	CMDCHAR	1A79	G(C7)
SESSION	1A8D	G(C7)	TASKS	1AA1	B(C2)
TERMINAL	1AB5	G(C7)	TIME	1AC9	G(C7)
TRANSACT	1ADD	A(C1)	USERS	1AF1	G(C7)
ACTIVE	1B05	G(C7)	NEWS	1B19	G(C7)
userid*	12A3	B(C2)	*	17F9	G(C7)

Offset 0CB5 in TPQUERY specifies what minimum class of user will have the ACB displayed on a QUERY SESSION command. As supplied this is 'F' (C6).

RESPONSE command

Module to zap: **TPRESPON**

Subcommand	Offset	Class	Subcommand	Offset	Class
CLEAR	O7B1	G(C7)	LIST	07C5	G(C7)

SET command

Module to zap: **TPSET**

Subcommand	Offset	Class	Subcommand	Offset	Class
DUMP	0D95	A(C1)	MAXUSERS	0DA9	B(C2)
PFK1	0DD1	G(C7)	PFK2	0DE5	G(C7)
PFK3	0DF9	G(C7)	PFK4	0E0D	G(C7)
PFK5	0E21	G(C7)	PFK6	0E35	G(C7)
PFK7	0E49	G(C7)	PFK8	0E5D	G(C7)
PFK9	0E71	G(C7)	PFK10	0E85	G(C7)
PFK11	0E99	G(C7)	PFK12	0EAD	G(C7)
PFK13	0EC1	G(C7)	PFK14	0ED5	G(C7)
PFK15	0EE9	G(C7)	PFK16	0EFD	G(C7)
PFK17	0F11	G(C7)	PFK18	0F25	G(C7)
PFK19	0F39	G(C7)	PFK20	0F4D	G(C7)
PFK21	0F61	G(C7)	PFK22	0F75	G(C7)
PFK23	0F89	G(C7)	PFK24	0F9D	G(C7)
SDWAOPT	0FB1	A(C1)	SESSCHAR	OFC5	G(C7)
MSKEY	OFD9	G(C7)	CMDCHAR	0FED	G(C7)
NEWS1	1015	B(C2)	NEWS2	1029	B(C2)
NEWS3	103D	B(C2)	NEWSFILE	1051	B(C2)
EDS	1065	G(C7)			

TPTRACE command

Module to zap: **TPTPTRAC**

Subcommand	Offset	Class	Subcommand	Offset	Class
OFF	03A1	A(C1)	RPL	03B5	A(C1)
DATA	03C9	A(C1)			

VTERM command

Module to zap: **TPVTERM**

Subcommand	Offset	Class	Subcommand	Offset	Class
ALL	0635	G(C7)	SESSIONS	064D	B(C2)

Sample ZAP to amend subcommand classes

```
//JOBNAME JOB    (ACCOUNT.CODE),'NAME',CLASS=A,MSGCLASS=X
//ZAP     EXEC   PGM=AMASPZAP,PARM=IGNIDRFULL
//SYSLIB  DD     DSN=your.multsess.loadlib,DISP=SHR
//SYSOUT  DD     SYSOUT=*
//SYSIN   DD     *

NAME TPECMD
VER 00DD  C3     DISPLAY major command was class C
REP 00DD  C4     DISPLAY major command now class D
IDRDATA USER002

NAME TPDISPLA
VER 05B5  C3     DISPLAY PANEL was class C
VER 05C9  C3     DISPLAY VPOOLS was class C
REP 05B5  C4     DISPLAY PANEL now class D
REP 05C9  C2     DISPLAY VPOOLS now class B
IDRDATA USER002
```

In this example, the subcommands of the DISPLAY command are assigned new classes:

```
DISPLAY PANEL  is changed to class D
DISPLAY VPOOLS is changed to class B
```

Because the default class of the DISPLAY major command is class C, this must be changed to class D (the lowest authority assigned to any of the subcommands) to allow all subcommands to be issued.

Multiple command input

Multiple MULTSESS commands
Multiple MULTSESS commands may be issued by typing commands into the command area on the screen or by pressing a PF key which has been set to represent the command string. All the commands will be executed before control is returned to the user.

Command character
MULTSESS recognizes a special command character to delimit multiple commands. A global default character may be set by the COMMAND-CHAR startup option. If this parameter is not specified, the global default is X'7E' (field mark). The global default may be overridden by typing the SET CMDCHAR command at the terminal or in a profile.

Setting PF Keys for multiple commands
When setting a PF key to represent multiple commands, beware of the implications of command character in the 'SET PFK' command. If the user's CMDCHAR is \, and the command SET PFK1 QUERY SESS\QUERY TIME is issued, the \ will mark the end of the SET PFK command, and the QUERY TIME command will be executed immediately. To set the PF key to issue both query commands, code the CMDCHAR twice:

SET PFK1 QUERY SESS\\QUERY TIME

Coding the CMDCHAR twice tells MULTSESS:

"Don't interpret this CMDCHAR yet"

Special considerations for multiple sessions commands
The following special considerations apply when SESSION and SHUTDOWN commands are included as part of a multiple command string:

Normal use
A SESSION command would normally switch a user out of MULTSESS into an application session. If more commands follow the SESSION command they could not then be executed.

Middle of the string
A SESSION command in the middle of a command string will not switch a user into session.

Existing application
If a session with the specified application already exists, the SESSION command is ignored and the remaining commands are processed.

New session
If a session does not already exist, a new session is started but the user remains in MULTSESS mode and the remaining commands are executed. The user may connect to the session at a later time.

End of string
If the SESSION command is the last command in the string, it is executed as normal and the user is switched into session with the application.

SHUTDOWN command
A SHUTDOWN command embedded within a command string will not be actioned.

Special use of command character from dynamic panel
PF key settings in dynamic panel mode are different from normal basic mode PF key settings. Users in dynamic panel mode may use out-of-panel PF key settings by typing their CMDCHAR in the command input area before pressing the required PF key. In this way, a dynamic panel user can name 24 PF keys to start sessions that are automatically set up when he/she goes into the dynamic panel. An additional set of 24 PF keys for executing MULTSESS commands may, for example, be set up by 24 SET PFK*nn* commands in a profile.

VTAM printer logmodes

MULTSESS exit point 4 supports the printing of application screen images on a VTAM network printer. A sample exit TPX04S13 is supplied to print on a VTAM printer or a JES printer, or to spool the images to a file. This exit is described in detail in a Technical Newsletter available from your local support office.

A problem that may be experienced when implementing this exit is that of an existing printer which appears not to work with MULTSESS but has been working successfully with CICS or IMS.

The problem occurs because the printer has not been fully defined to VTAM (i.e. the default VTAM logmode definition in SYS1.VTAMLST has not been defined or the printer LU has been defined with the same default logmode as the terminal LUs).

When the printer is working with CICS and IMS, this problem is not apparent since these applications override the VTAM bind parameters, derived from the logmode, with values taken from their own internal tables. As long as the application's internal table definitions are correct, the printer works successfully with CICS or IMS.

MULTSESS does not impose the restriction of requiring internal terminal definitions over and above the normal VTAM definitions. If you are experiencing difficulty in using network printers with MULTSESS, you should review the SYS1.VTAMLST definitions and ensure that MODETAB and DLOGMOD parameters specify a logmode appropriate to the device.

The next page lists sample logmode definitions applicable to IBM network printers.

```
ZOOMP     MODETAB
*
**********************************************************
* NON-SDLC PRINTER
**********************************************************
*
P00       MODEENT LOGMODE=P00,                              +
                  FMPROF=X'02',                             +
                  TSPROF=X'02',                             +
                  PRIPROT=X'71',                            +
                  SECPROT=X'40',                            +
                  COMPROT=X'2000',                          +
                  RUSIZES=X'0000',                          +
                  PSERVIC=X'000000000000000000000200'
*
**********************************************************
* SDLC SCS PRINTER
**********************************************************
*
P01       MODEENT LOGMODE=P01,                              +
                  FMPROF=X'03',                             +
                  TSPROF=X'03',                             +
                  PRIPROT=X'B1',                            +
                  SECPROT=X'90',                            +
                  COMPROT=X'3080',                          +
                  PSNDPAC=X'01',                            +
                  SRCVPAC=X'01',                            +
                  RUSIZES=X'87C6',                          +
                  PSERVIC=X'01000000E100000000000000'
*
**********************************************************
* SDLC NON-SCS PRINTER
**********************************************************
*
P03       MODEENT LOGMODE=P03,                              +
                  FMPROF=X'03',                             +
                  TSPROF=X'03',                             +
                  PRIPROT=X'B1',                            +
                  SECPROT=X'90',                            +
                  COMPROT=X'3080',                          +
                  RUSIZES=X'87C6',                          +
                  PSERVIC=X'030000000000000000000200'
*
          MODEEND
          END
```

The MVS operator interface

Startup parameter
If the startup parameter MULTOPER=YES is specified, the MVS console operator may monitor and control MULTSESS from an MVS console using the MVS STOP (P) and MODIFY (F) commands.

MULTSESS commands
The full range of MULTSESS commands is available to the MVS operator. Any command which can be issued from a logged on terminal may be issued from an MVS console. Commands which are clearly inappropriate for a console, such as starting an application session or displaying a panel will be ignored. Command responses will be sent to the console using SVC 35 (WTO).

Examples
```
F MULTSESS,Q USERS
F MULTSESS,SET NEWS1 TSOA CLOSING AT 13.00 HRS
F MULTSESS,MSGAPP TSOA TSOA CLOSING IN 5 MINS
F MULTSESS,STOP TSOA FORCE
P MULTSESS
```

Note: Enclosing quotes are *not* required for commands containing spaces.

Dummy userid
If the startup parameter MULTOPER=YES is specified, a dummy userid called MULTOPER is created internally. All commands originating from MVS consoles are processed under this userid. MULTOPER is marked as permanently logged on and cannot be forced off. However SHUTDOWN, which will not usually be actioned if all users are not forced off, will ignore the presence of MULTOPER and will complete normally if other users are logged off.

Screen image send

Sending a screen image

MULTSESS has the capacity to send an application screen image from one user to another, for example a user may send the results of a transaction or CLIST to a manager for review, and a user experiencing difficulties with an application may send the screen image to the help desk for diagnosis. The user is relieved of the frustration of trying to explain the problem over the telephone and the help desk can solve the problem more quickly since all relevant information is available.

IMAGE command options

The various options of the IMAGE command provide facilities for sending, receiving, querying, viewing and deleting stored images.

A user may send the latest screen image of any session to another user, or save the image for later viewing by himself, by using the IMAGE SEND command.

To prevent accidental misdirection of images (e.g. a mistyped userid) the receiving user must indicate a willingness to receive the image by use of the IMAGE ON command. It is recommended that all users run with IMAGE OFF (the default state) until such a time as an image is to be received.

The transmitted image is queued to the receiving user for later review, by using the IMAGE VIEW command. Images may be sent regardless of incompatibilities between the terminals used by the sending and receiving users. If the receiving user's terminal cannot display the image (e.g. a model 5 screen image sent to a user of a model 2 terminal), the receiving user may disconnect and reconnect on a compatible terminal to display the image.

Images remain queued to the receiving user until explicitly deleted by an IMAGE DELETE command, or until the user logs off. IMAGE VIEW may be issued several times to view and review an image.

If a user is unable to issue an IMAGE SEND command (for example, in user panel mode with no command input area), an authorized user such as a help desk technician may issue IMAGE GET to obtain a copy of the required session image.

Broadcast message facility

Hot news
MULTSESS supports the setting, amending and displaying of up to three lines of hot news broadcast messages.

News lines
News lines are set or updated by a suitably authorized user using the SET NEWS*n* command. Use of this command is described in the MULTSESS/HPO User Reference Manual on page 2.64.

Storage
Once set, news lines are held in storage for display purposes and are stored in the partitioned dataset member pointed to by the NEWS DD statement in the JCL used to start MULTSESS. This dataset is compatible with the NCI/XF and NC-ACCESS hot news datasets and may be shared between MULTSESS and NCI.

Current news lines
The current news lines are displayed to all users in dynamic panel mode. Current news may be included in the MULTSESS logo by including variables &SYSNEWS1-3 in the logo definition.

When MULTSESS is started, the current news lines are loaded from the news dataset. While MULTSESS is active, the current news may be refreshed from the dataset using the SET NEWSFILE command.

This is particularly useful for customers who use the NCI/XF Starter System to maintain system-wide broadcast messages. Having updated the messages and stored them into the hot news dataset, NCI can issue the command:

    F MULTSESS,SET NEWSFILE

(using the SVC34 exit in NCI) to tell MULTSESS to pick up and display the updated news from the shared news file.

Application screen print facility

PRINT command

The PRINT command may be used to take a hardcopy snapshot of the current screen image from an application session.

Whenever a PRINT command is issued, the screen image is passed to user EXIT04 for final formatting and routing. If EXIT04 is not enabled, the PRINT command becomes inoperative.

Sample exit routine

A sample exit routine, TPX04S13, is supplied in source and may be modified by the customer to provide any required post-processing and routing.

The sample exit provided will recognize three options, F, S and V which may be specified on the PRINT command:

F   will cause the captured screen image to be written to a disk file called MULTSESS.PRINT.userid.

    If a file of that name is found in the system catalog, the volume specified is used, otherwise the default volume specified in the exit is used.

    If a file of the required name exists on the selected volume, the image is appended to the existing file.

    If necessary, a new file will be created to contain the image. This new file will not be cataloged.

    The default values for dataset name, volume serial, and device type and space may be easily changed by amending the constants &DSN, &VOL, &DEV and &TRK in TPEXIT04 and reassembling the exit into the MULTSESS load library.

S   will cause the screen image to be written to the JES2 spool, using the job/started task name used to invoke MULTSESS. A new outgrp will be created for each image.

    Output will be queued to JES remote 14, output class A and form type 0001. The defaults may be changed by amending the constants &RMT, &CLASS and &FORMS and reassembling the exit into the MULTSESS load library.

V   the screen image will be passed to a local VTAM printer. The printer id can be specified in EXIT04 or as an additional third parameter along with other options.

Performance monitoring

The following three performance monitoring methods are provided with MULTSESS/HPO:

- the RESPONSE command
- the ECHO command
- Network Performance Monitor.

RESPONSE command

The RESPONSE command reports response times between MULTSESS and all application(s) with which the user is communicating.

Application response time monitoring is always active. The current accumulators may be cleared using the RESPONSE CLEAR command. New statistics will be accumulated from that time.

All SENDs and RECEIVEs of application data are time stamped by MULTSESS, and statistics for the average, aggregate and longest response times for the user are maintained.

If all applications are in the same CPU as MULTSESS, the times reported are the application internal response times, plus the minimal (CPU only) time for VTAM to deliver data from the application to MULTSESS.

If the applications are cross-domain, the times reported are the application internal response times plus the cross-domain network time.

The RESPONSE command is described in the MULTSESS/HPO User Reference Manual on page 2.54.

ECHO command

The ECHO command allows network response time to be tested, i.e. network transmission times between MULTSESS and the terminal.

The ECHO command will cause request units (RUs) of the specified size to be transmitted from MULTSESS to the terminal a user defined number of times. The RUs are sent from MULTSESS to the terminal requesting a definite response. The responses reported are the difference between the time the data is sent by MULTSESS and the time the response was received from the terminal.

ECHO separately reports the time required for VTAM to accept the data for transmission and the actual transmission time through the network.

Network Performance Monitor

IBM's Network Performance Monitor (NPM) allows you to collect data for tuning and accounting purposes on connect time, usage and response times for individual managed application sessions, rather than the MULTSESS session as a whole.

NPM uses the Network Synergy Interface (NSI) to communicate with MULTSESS. Sessions are then established:

- between the users' LU and MULTSESS
- between MULTSESS and one or more applications e.g. CICS or TSO etc.

The performance data for these two real sessions can be combined and reported as one relay or extended session when viewed via the NPM dialogs and can be treated as one session when post-processed.

NSI runs as a separate started task and uses synchronous cross-memory inter-address space communication to pass data from MULTSESS to NPM whenever certain events take place. These events include the correlation of userids to terminal and application sessions, current selected applications and notification of their beginning and ending. For further information refer to the IBM manual entitled *NetView Performance Monitor Installation and Customization*.

The module TPNPM is called whenever any of the following events occur:

- a user logs on or off
- a user disconnects or reconnects
- a user application session starts or ends
- a user switches into an application session or back to MULTSESS mode.

These calls are made close to the corresponding MULTSESS exit point in most cases.

Two startup options, listed below, are also provided.

NPM = YES|<u>NO</u>
Specifies whether the NPM interface is to be started or not. The default is NO.

NPMTRACE = YES|<u>NO</u>
Specifies whether the NPM event trace facility within MULTSESS is to be started or not. The trace facility is provided to show, on the MULTSESS log, the NPM interface calls being made. The default is NO.

The SET NPM command can also be used to start the NPM interface and trace facility. Refer to *SET NPM* on page 2.67 of the MULTSESS/HPO User Reference Manual.

The module FNMNSI (supplied with NPM) must be available for calling by MULTSESS. A dummy FNMNSI is supplied with MULTSESS/HPO which does nothing and must be replaced by the real module copied from the NPM load library, or be ignored by concatenating steplibs. A warning message is written to the MULTSESS log if the dummy module is being used.

Chapter 5 - User exits

Supplied user exit points

MULTSESS/HPO provides 9 user exit points enabling users to implement installation specific refinements in the MULTSESS/HPO environment. The exits points are numbered 0 through 8, and are referred to as TPEXIT00, TPEXIT01 etc. throughout the documentation.

Exit point positions

The positions of the exit routines are summarized below. Each exit is described in detail later in this chapter.

TPEXIT00	-	MULTSESS/HPO startup and shutdown
TPEXIT01	-	Terminal input to MULTSESS/HPO
TPEXIT02	-	Session initiation and termination
TPEXIT03	-	MULTSESS/HPO subcommand execution
TPEXIT04	-	MULTSESS/HPO PRINT command issued
TPEXIT05	-	Terminal data input to application
TPEXIT06	-	Application data output to terminal
TPEXIT07	-	Terminal logon to MULTSESS/HPO
TPEXIT08	-	Dynamic panel build

Enabling, disabling and naming exit routines

Exits may be selectively enabled when MULTSESS/HPO is initialized using the EXIT startup parameter. Exits may be enabled or disabled, or exit status displayed, while MULTSESS/HPO is active using the EXIT command.

Exit load modules must always reside in a load library accessible to MULTSESS/HPO (e.g. linklist library or MULTSESS/HPO steplib library). Modules must be named TPEXIT*nn*, where *nn* is the exit number. The load library loaded from the MULTSESS/HPO distribution tape contains a TPEXIT*nn* module for each supported exit point. These are dummy routines which merely issue a log message indicating the exit called and the code passed. The MULTSESS/HPO sample source library contains example routines for each exit point.

New and amended exit routines

Use the LOAD command to bring new and amended exit routines into use while MULTSESS/HPO is running.

Reasons for exit calling

User exits are called at specific points in MULTSESS/HPO processing. Some exits have multiple call points. For example TPEXIT00 which is invoked at MULTSESS/HPO startup and at shutdown time. Some exits may be called as a result of a particular event, but in differing circumstances. For example, TPEXIT02 may be called as a result of normal session termination or as the result of FORCE command processing.

Sample exit routines

Sample exit routines are supplied for all MULTSESS/HPO exit points. The assembler source is supplied in the sample library loaded from the distribution tape. A list of all the available exits is given in the supplied Installation Guide.

Writing SMF records from MULTSESS/HPO

MULTSESS/HPO provides a number of user exit points to enable you to implement installation specific refinements within the MULTSESS environment. Any of the standard exit points may be used to write SMF records for post-processing and analysis.

The distribution tape contains all the source code for two sample SMF exit routines for use at exit points 2 and 7:

> TPX02S09 - MULTSESS exit point 2, called at:
> - session initiation
> - session termination
> - session switch

> TPX07S09 - MULTSESS exit point 7, called at:
> - logon to MULTSESS
> - reconnect to MULTSESS
> - logoff from MULTSESS
> - disconnect from MULTSESS

The supplied exits are examples which may be used as supplied, as a basis for customization or as skeleton routines for incorporation into other routines and other exit points.

SMF record type
Both supplied routines write SMF records with an SMF record type of 245. The record type value is held as a constant at label SMFC. To change the SMF record type, amend the statement:

```
SMFC DC Y(SMFLEN,0),X'02',AL1(245)
```

to read:

```
SMFC DC Y(SMFLEN,0),X'02',AL1(nnn)
```

where *nnn* is your chosen SMF record id, and assembling the updated source.

SMF record format
The SMF records written by the sample routines contain a header portion followed by the contents of the standard MULTSESS exit parameter list. This parameter list contains all information required for meaningful post-processing and analysis.

The format of the SMF record header portion is defined within the WAREA DSECT of the supplied routines:

```
WAREA    DSECT
SMF      EQU  *
SMFRDW   DS   AL2    Record Descriptor word
SMFSDW   DS   AL2    Segment descriptor word
SMFSYS   DS   XL1    SMF system indicator
SMFREC   DS   XL1    SMF record type (245)
SMFTIME  DS   AL4    Time in TIME BIN macro format
SMFDATE  DS   AL4    Date in TIME BIN macro format
SMFSID   DS   CL4    SMF system name
SMFEXIT  EQU  *      The contents of the exit parameter list follows
```

Deciding why records are written

The MULTSESS exit points for which sample SMF routines are supplied may be called for one of a number of reasons. For instance, exit point 2 may be invoked when a session is started, ended, switched into or out of. The reason why an exit was invoked is indicated by the 'call code' in field EXITCODE, the first byte of the parameter list passed to the exit. This call code is written as part of the SMF record, together with all other information in the parameter list.

It is therefore not required that MULTSESS write more than one SMF record type, since your post-processing routines may distinguish between different events using the 'call code'.

Authorized libraries

Records are written to SMF using the SMFWTM macro. To use this macro, MULTSESS must be running from an authorized library or be APF authorized in the MVS Program Properties Table. If an SMF exit routine is enabled on a non-authorized system, the exit will be called but the SMFWTM request will be bypassed and no data will be written.

Assembling the routines

The source of TPX02S09 and TPX07S09 is supplied in the sample library, unloaded from the distribution tape as part of the installation process.

For an exit routine to be called during MULTSESS execution, the routine must exist as a load module called TPEXIT*nn* in the MULTSESS steplib library, where *nn* is the exit point number. The exit point must be enabled via the MULTSESS EXIT= startup parameter or by a suitably authorized MULTSESS user issuing an EXIT ENABLE command.

After making any required changes to the supplied exit source, assemble them using the JCL supplied in sample library member ASMSAMP, then rename the resultant load as follows:

TPX02S09 → TPEXIT02

TPX07S09 → TPEXIT07

If you wish to write SMF records at other points within MULTSESS, simply duplicate the source, make any installation-specific changes and assemble using the appropriate exit name. For instance, to write an SMF record at MULTSESS startup and termination, create a source member called TPEXIT00 and assemble this using the JCL in ASMSAMP.

Exit call codes

To enable your exit routines to distinguish between different events, the first byte of the standard parameter list contains a code to indicate exactly the circumstances in which the exit routine has been invoked.

The table below lists the possible exit codes with an indication of the circumstances in which the code is used. The call codes listed are hexadecimal values. The first digit indicating the applicable exit number, i.e. codes 00 and 01 apply to TPEXIT00.

EXIT CODE	CALLED FROM	DESCRIPTION
01	TPCP1	MULTSESS initialization.
02	TPSHUTDO	MULTSESS termination.
11	TPCP1	Terminal data for MULTSESS. User not in session.
12	TPCP1	Terminal data for MULTSESS. User in session. SESSCHAR or MSKEY entered.
13	TPCP1	Signal from terminal. User in session. ATTN key entered
21	TPNSESS	SESSION command for new session. Vterm not required by application.
22	TPVSCIP	Session ended normally.
23	TPVNSEXI	Session ended (usually abnormally).
24	TPTERMSE	VTAM TERMSESS request failed. MULTSESS is cleaning up the session. (Successful TERMSESS will drive SCIP).
25	TPFORCE	Session termination by FORCE command. MULTSESS is cleaning up the session. (Successful TERMSESS will drive SCIP).
26	TPNSESS	Session request failed, for example: INQUIRE failed (appl inactive), REQSESS failed, All ACBs in vpool already in use.
27	TPNSESS	Session request for CONNECT type appl (CLSDST PASS requested).
28	TPNSESS	SESSION command for new session. Unique vterm to be used.
29	TPNSESS	SESSION command for new session. Pooled vterm ACB has been allocated.

EXIT CODE	CALLED FROM	DESCRIPTION
2A	TPNSESS TPOSESS	Switching into session, either a new session or re-connection to an existing session
2B	TPNSESS TPVSCIP	User switching out of session, by entering switch character or ATTN, or at session termination.
2C	TPTERMSE	TERMSESS command issued to close an application session.
2D	TPTERMCO	TERMCOND command issued to conditionally close an application session.
31	TPSUBT	Subcommand execution. Command is in terminal buffer.
32	TPSUBT	Subcommand execution. Null buffer.
41	TPPRINT	PRINT command entered for valid alias.
51	TPCP1	Terminal data to application.
52	TPATR02	ATP data to application.
61	TPCP1	Application data to terminal.
71	TPLOGON	User initial logon. Password of EXIT in directory.
72	TPLOGON	User reconnecting to MULTSESS.
73	TPDISCON TPCLSDST (fix 11 not applied)	User disconnecting from MULTSESS. (DISCONNECT command in progress - CALL 73).
74	TPLOGOFF	LOGOFF command in progress.
75	TPCLSDST (fix 11 not applied)	Disconnect from MULTSESS (not DISCONN command)
82	TPPANEL	Dynamic panel build time.
83	TPQUERY	QUERY * command issued.
84	TPSESSIO	New session authorization exit.

Data available to exits

All exits are passed the address of a standard parameter list in register 1. A DSECT for the standard parameter list can be generated using the EXIT macro supplied with MULTSESS, and should be used (as all fields are not applicable to all exits).

The format of the standard parameter list is indicated on the following pages. The applicability of each parameter to each exit call is indicated in the table below.

CODE	01	02	11	12	13	21	22-23	24-26	27	28	29	2A-2B	2C-2D	31	32	41	51	52	61	71	72	73	74	75	82	83	84
CONS	R	R	R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
PLST			R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
SEND			R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
GETM	R	R	R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
STCK			R	R	R			R	R	R	R	R	R	R	R	R	R	R	R	R	R				R	R	R
BUFA			P	P		P		P	P	P	P			P	P	R	P	P	P	P	R	R			R	R	
BUFL			R	R		W		W	W	W	R			R	R	R	W	W	W	R	R				R	R	
TERM			R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
USER			R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
LOGM			R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
PROF			R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	W	R	R	R	R	R	R	R
SYM			R	R	R	R		R	R	R	R	R		R	R	R	R								R	R	R
ALIA				R	R	R		R	R	R	R	R	R	R	R	R	R										
NODE				R	R	R		R	R	R	R	R	R	R	R	R	R								R	R	R
VTRM				R	R	R		R	R	W	R	R	R	R	R	R	R										
ROWS														R	R	R	R										
COLS														R	R	R	R										
ROWA																R	R										
COLA																R	R										
CCHR			R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
SESC			R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
MSKY			R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
FLAG			R	R	R	R		R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
OPT																R			R								
CHN																	R	R	R								
STAT					R												R	R									
UFLD			W	W	C			R		C	C	W	W			W	W	W	W								
UCTL			W	W	W	W		W	W	W	W	W	W	W	W	W	W	W	W	W	C	W	W	R	W	W	W
SECR				R	R	R		R	R	R	R	R	R			R	R	R	R						R	R	R
PARM																R											
HDRE																											
2NOT						R																					
2LRT						R																					
2ART						R																					
2TRT						R																					
2HRT						R																					
2THR						R																					
2CID												R															
2ACB												P															
2F1												W															
7PWD																								C			

R	=	value is set on entry and is READ-ONLY.
W	=	value is set on entry and is READ-WRITE.
C	=	value is set on entry and may be CREATED.
blank	=	value is zero on entry and may not be updated.
P	=	address is read-only; data pointed to is writable.

Standard entry parameter list

EXITCODE	DS	X	EXIT CALL CODE
	ORG	EXITCODE	
EXITCONS	DS	A	ADDRESS OF USER CONSOLE WRITE RTN
EXITPLST	DS	A	ADDRESS OF USER RTN PARM LIST
EXITSEND	DS	A	ADDRESS OF USER WRITE RTN
EXITGETM	DS	A	ADDRESS OF USER GETMAIN RTN
EXITSTCK	DS	A	ADDRESS OF USER STACK RTN
	DS	A	RESERVED FOR FUTURE USE
EXITBUFA	DS	A	BUFFER ADDRESS.
EXITBUFL	DS	F	LENGTH OF BUFFER DATA
EXITTERM	DS	CL8	TERMINAL NODE NAME
EXITUSER	DS	CL8	USER ID
EXITLOGM	DS	CL8	TERMINAL LOGMODE
EXITPROF	DS	CL8	CURRENT USER PROFILE NAME
EXITSYM	DS	CL8	SESSION SYMBOLIC NAME
EXITALIA	DS	CL8	SESSION ALIAS
EXITNODE	DS	CL8	SESSION NODENAME
EXITVTRM	DS	CL8	SESSION VTERM ACBNAME
EXITROWS	DS	X	NUMBER OF ROWS ON SCREEN
EXITCOLS	DS	X	NUMBER OF COLUMNS ON SCREEN
EXITROWA	DS	X	NUMBER OF ROWS ON SCREEN (ALT)
EXITCOLA	DS	X	NUMBER OF COLUMNS ON SCREEN (ALT)
EXITCCHR	DS	C	CURRENT COMMAND CHARACTER
EXITSESC	DS	C	CURRENT SESSION CHARACTER
			IF EXITPFKS=0 - SET TO CHARACTER
			IF EXITPFKS=1 - SET TO AID VALUE
EXITMSKY	DS	C	CURRENT MULTSESS KEY
			IF EXITPFKM=0 - SET TO CHARACTER OR X'00' IF OFF
			IF EXITPFKM=1 - SET TO AID VALUE OR X'00' IF ATTN
EXITFLAG	DS	X	EXIT FLAGS
EXITPFKS	EQU	X'80'	SESSCHAR IS PA/PFK
EXITPFKM	EQU	X'40'	MULTSESS KEY IS PA/PFK
EXITMPAN	EQU	X'20'	USER IN MULTSESS PANEL MODE
EXITUPAN	EQU	X'10'	USER IN USER PANEL MODE
EXITROBN	EQU	X'08'	USER ROUND ROBIN ENABLED
EXITLU2	EQU	X'04'	TERMINAL IS LUTYPE 2
EXITVUSE	EQU	X'02'	VTERM ALREADY IN USE
EXITSCR	EQU	X'01'	SCRIPT IN PROGRESS
EXITOPT	DS	X	USER OPTION BYTE
EXITCHN	DS	X	BUFFER VTAM CHAINING INDICATOR
EXITFIC	EQU	X'80'	FIRST IN CHAIN
EXITMIC	EQU	X'40'	MIDDLE IN CHAIN
EXITLIC	EQU	X'20'	LAST IN CHAIN
EXITOIC	EQU	X'10'	ONLY IN CHAIN
EXITSTAT	DS	X	EXIT STATUS
EXITSESS	EQU	X'80'	USER IN THIS SESSION
	DS	X	RESERVED FOR FUTURE USE
EXITUFLD	DS	F	USER FULLWORD (SESSIONS)
EXITUCTL	DS	F	USER FULLWORD (USER)
EXITSECR	DS	CL8	SECURITY PARM FROM DIRECTORY OR ADT

Standard entry parameter list (*continued*)

```
EXITPARM          DS        A             ADDRESS OF USER SPECIFIED PARAMETERS
                  DS        A             RESERVED FOR FUTURE USE
                  DS        A             RESERVED FOR FUTURE USE
                  DS        A             RESERVED FOR FUTURE USE
*
* AREA OF EXIT PARM LIST THAT CONTAINS FIELDS DEPENDENT ON THE CALL CODE
*
EXITHDRE          DS        0A            END OF THE HDR AREA
*
* EXIT DEPENDENT FIELDS RELATING TO CALL CODES X'22' AND X'23'
* SAMPLE EXIT TPX02S22 DEMONSTRATES USE OF THESE FIELDS
*
                  ORG       EXITHDRE
EXIT2NOT          DS        XL4           NO. OF TRANSACTIONS
EXIT2LRT          DS        XL4           LAST RESPONSE TIME (HUNDREDTHS)
EXIT2ART          DS        XL4           AGGREGATE RESPONSE TIME (HUNDREDTHS)
EXIT2TRT          DS        XL4           TOTAL RESPONSE TIME (HUNDREDTHS)
EXIT2HRT          DS        XL4           HIGHEST RESPONSE TIME (HUNDREDTHS)
EXIT2THR          DS        XL4           TIME HIGHEST RT OCCURRED (HUNDREDTHS)
                  DS        XL32          RESERVED FOR FUTURE USE
*                                         AT THE END OF THE CONTROL BLOCK
*
* EXIT DEPENDENT FIELDS RELATING TO CALL CODES X'2A' AND X'2B'
* SAMPLE EXIT TPX02S08 DEMONSTRATES USE OF THESE FIELDS
*
                  ORG       EXITHDRE
EXIT2CID          DS        CL4           CID CONTENTS FROM HPO RPL
EXIT2ACB          DS        F             A(HPO ACB)
EXIT2F1           DS        X             FLAG BYTE 1
EXIT21EB          EQU       X'80'           WE ARE NOT IN A BRACKET
*                                           MUST BE SET OR UNSET BY HPO OR EXIT
*                                           IF YOU DO A SEND
                  DS        XL32          RESERVED FOR FUTURE USE
*                                         AT THE END OF THE CONTROL BLOCK
*
* EXIT DEPENDENT FIELDS RELATING TO CALL CODE X'71'
* SAMPLE EXIT TPX07S07 DEMONSTRATES USE OF THESE FIELDS
*
                  ORG       EXITHDRE
EXIT7PWD          DS        AL1, CL8      RANDOM PASSWORD RETURNED FROM EXIT07
*                                         LENGTH,TEXT
*                                         LENGTH IS ZERO ON ENTRY
                  DS        XL32          RESERVED FOR FUTURE USE
*                                         AT THE END OF THE CONTROL BLOCK
                  ORG
                  DS        0D            MAKE MACRO PRODUCE AN INTEGRAL
*                                         NUMBER OF FULL WORDS
*
EXITLEN           EQU       *-EXITCONS
EXITLENZ          EQU       *-EXITPLST
```

Communication information

Between exit routines

MULTSESS provides for communication between exit calls at three levels:

- A global communication area, available to all calls to all enabled exits by all users.

- A user-related communication area available to each exit call on behalf of the user.

- A session-related communication area, available to each exit call applicable to the session.

Areas
Global exit

When EXIT00 returns control to MULTSESS at startup time, the value returned in register 0 will be saved and passed, in R0, on each call to all other exit routines.

The value in R0 may be anything, but is typically the address of a block of virtual storage that was obtained by EXIT00 using GETMAIN.

User related

The standard entry parameter list contains a fullword called EXITUCTL. A unique version of EXITUCTL is maintained for each user and is available to all exits called on behalf of the user. The fullword may itself be used as an exit communication area (flag bits, counters etc.) or may be used to hold the address of a storage area containing user-specific data.

Session related

The standard entry parameter list contains a fullword called EXITUFLD. A unique version of EXITUFLD is maintained for each session and is available to all session related exits calls. The fullword itself may be used as a communication area (flag bits, counters etc.) or may be used to hold the address of a storage area containing session-specific data.

Obtaining storage for

It is recommended that most working storage for exit routines is obtained using the EXITGET macro supplied with MULTSESS, since this storage will be automatically freed by MULTSESS at exit termination and must not be freed by the user. Communication areas must be obtained using the IBM GETMAIN macro since ownership of the storage is needed beyond the life of the exit which obtained it. Remember to FREEMAIN user and session communication areas (obtained by GETMAIN) at logoff and session termination respectively.

MULTSESS/HPO supplied macros

Sample library file
The MULTSESS sample library contains a number of macros for use within your exit routines. If you do not use the supplied sample JCL to assemble your exit routines (member ASMSAMP in the sample library), you must copy the macro definitions to a library accessible to your assembly JCL procedure.

Macros supplied

EXIT   -   not all fields are available at all exits.

Use   -   to map out parameter list area to allow access via DSECT symbols.

EXITLOG

Use   -   To write a message to the MULTSESS console log from a MULTSESS user exit (pointed to by the CONSOLE DD statement).

FIELD	PARAMETER
&MSG	'XXXXXXXX'/ ADDRESS /(1)-(15)
	'XXXXXXXX' - a quoted string specifying the message. ADDRESS - a label representing the address of the message to be written. (1)-(15) - a register containing the address of the message to be written.
&LENG	(Omitted) / LENGTH/(1)-(15)
	(Omitted) - If the length is not provided, the implied assembler length of the message will be used. LENGTH - the explicit length of the message. (1)-(15) - a register containing the length of the message.

EXITOUT - standard exit macro for returning control to MULTSESS at exit termination.

Use   -   to provide the exit linkage between the user exit and MULTSESS. It provides support for both reentrant and non-reentrant forms of exit.

Registers 15 and 0 are passed back to the caller.

FIELD	PARAMETER
RENT	YES - the savearea should be FREEMAINed.
	NO - the savearea should not be FREEMAINed.

EXITIN - standard entry macro which should be used in all exits to establish linkage and savearea conventions and obtain a work area for reentrant routines.

Use - to provide the entry linkage between MULTSESS and the user exit. It provides support for both reentrant and non-reentrant forms of entry.

FIELD	PARAMETER
RENT	YES - the savearea and work area are to be getmained and formatted.
	NO - the save area is already declared in-line.
BASE	N - the register to be used as the base register for the MULTSESS user exit.
EXIT	N - the register to be used as the base register for the exit parameter list.
USER	OMITTED - the value of register 0 (i.e.- the user area set up by TPEXIT00) - and is not to be saved.
	N - the register in which the value of register 0 on entry is to be copied to.
AREA	If RENT=YES is specified: (OMITTED)/(DSECTNAME,(LENGTH/(1)-(15)),N,X'NN'
	(OMITTED) - no work area is to be automatically set up.
	DSECTNAME - the name of the DSECT defining the work area that the MULTSESS user exit is to use.
	LENGTH - the explicit length of the work area.
	(1)-(15) - a register containing the length of the work area.
	N - the register to be used as the base register for the work area.
	X'NN' - the value that the work area is to be cleared to after being GETMAINed.
	If RENT=NO is specified:
	ADDRESS - is the label representing the save area that is to be used by the MULTSESS user exit.

EXITPUT

Use - To write a message to the user's screen from a MULTSESS user exit.

FIELD	PARAMETER
&MSG	'XXXXXXXX '/ADDRESS/(1)-(15) 'XXXXXXXX' - a quoted string specifying the message. ADDRESS - a label representing the address of the message to be written. (1)-(15) - a register containing the address of the message to be written.
&LENG	(OMITTED) / LENGTH/(1)-(15) (OMITTED) - If the length is not provided, the implied assembler length of the message will be used. LENGTH - the explicit length of the message. (1)-(15) - a register containing the length of the message.
&HI	YES/NO YES - if this message is to be highlighted on the user's screen. NO - if this message is to be normal intensity.

EXITGET - This macro should be used to acquire all dynamic storage except exit communication areas. All storage obtained by EXITGET is automatically freed by MULTSESS when the exit completes.

Use - to obtain storage in a MULTSESS user exit that will be automatically cleaned up by MULTSESS after the exit completes.

FIELD	PARAMETER
AREA	LENGTH/(1)-(15) LENGTH - the explicit length of the area to be obtained. (1)-(15) - a register containing the length of the area to be obtained.
PAD	X'NN' - the value that the GETMAINed area is to be cleared to. The default is NULLS.

EXITCMD

Use   -   To stack a MULTSESS command on behalf of the user.

            If the user is in session, a switch out of session will automatically be performed.

FIELD	PARAMETER
CMD	'XXXXXXXX'/ADDRESS/(1)-(15) 'XXXXXXXX' - a quoted string specifying the command. ADDRESS - a label representing the address of the command to be stacked. (1)-(15) - a register containing the address of the command to be stacked.
LENG	(OMlTTED)/LENGTH/(0)-(15) (OMITTED) - if the length is not provided, the implied assembler length of the command will be used. LENGTH - the explicit length of the command. (0)-(15) - a register containing the length of the command.
POST	YES/NO YES - if this is one of the mainline exits, i.e. TPEXIT01, TPEXIT02, TPEXIT05, TPEXIT06, the last call to stack from an exit should specify POST=YES to cause execution of any stacked commands. NO - otherwise POST=NO should be specified for efficiency reasons.
POS	TOP/OMITTED TOP - the command will be placed at the top of the user's command stack. OMITTED - the command will be placed after commands already on the user's stack.

EXITEQU

Use   -   Register equates used in all sample exits.

Note: The sample library contains examples of the use of all macros.

Register conventions

Exit routines
Exit routines should be written in assembler language using standard linkage conventions.

Registers - on entry

R0	-	Address of optional exit communication area set up in EXIT00 at MULTSESS startup time. Refer to *Communication information* on page 5.9
R1	-	Address of a standard parameter list passed by MULTSESS to all exit routines. Refer to the *Standard entry parameter list* on page 5.7 for further details.
R2 - R12	-	Unpredictable.
R13	-	Savearea address (72 bytes).
R14	-	Return address.
R15	-	Entry point address.

Registers - on exit

R0	-	Address of exit communication area may be passed to MULTSESS from EXIT00 at startup time. Any other exit is ignored.
R1	-	Ignored.
R2 - R13	-	Must be restored to those on entry.
R14	-	Ignored.
R15	-	Return code (exit dependent).

Macros EXITIN and EXITOUT
The MULTSESS supplied macros, EXITIN and EXITOUT, may be used to maintain the required linkage conventions.

Writing exit routines
Exit routines should be written in assembler language using standard OS linkage conventions.

TPEXIT00		Call code 01 - 02

Reentrancy	01	Non-reentrant, reusable.	
When called	01	TPCP1	- During initialization of MULTSESS, before any terminals log on.
	02	TPSHUTDO	- During termination of MULTSESS, after all users have logged off. In response to the SHUTDOWN command
Suggested uses	01		Typically used to getmain an area (not with EXITGETM) returned via RO, for passing to all other exits.
	02		Typically used to print out any statistics accumulated during MULTSESS execution and free off the GETMAIN area obtained in exit call code 01.
Return codes	01		The contents of RO will be passed to all future exit calls in RO.
	01		A nonzero return code in R15 will cause MULTSESS to shutdown immediately.

TPEXIT00			Call code 01

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine
GETM	R	A	Address of the GETMAIN routine.

Note

TPEXIT00			Call code 02

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine
GETM	R	A	Address of the GETMAIN routine.

Note

TPEXIT01	Call code 11 - 13

Reentrancy	Non-reentrant, reusable.
When called	TPCP1 **Call codes 11 to 13** Whenever terminal input is received from a terminal which contains data for MULTSESS to process. This may be because the user has: typed a MULTSESS command, hit a PF key which has generated a MULTSESS command, entered a SESSCHAR when in an application session (the SESSCHAR may be followed by a MULTSESS command), hit the ATTN key while in session.
Suggested uses	Implement new commands. Disallow commands. Modify text of commands or subcommands. Generate automatic commands (e.g. user types transaction name and MULTSESS switches to the appropriate session).
Return codes	Ignored.
Notes	EXIT01 is called when terminal input is received from a user in MULTSESS mode. The exit is called **before** MULTSESS has carried out any processing on the input, i.e. the input has not been validated for command syntax. **Call codes 11** - User already in MULTSESS mode. **12** - User has just switched to MULTSESS mode from an application session. **13** - User has hit ATTN in application session For call codes **11** and **12**, the address of the users command input area is supplied in the BUFA field of the entry parameter list. The buffer length is always 126 bytes. The exit is called before MULTSESS has tested the input for validity. The buffer may contain valid or invalid MULTSESS commands. There may be multiple commands separated by the user's command separator character (CMDCHAR).

| **TPEXIT01** | **Call code 11 - 13** |

Notes continued If the call code is 13, indicating that the user has hit the ATTN key while in session, no buffer is supplied. Your exit may wish to note that the user is switching out of session, but may take no other action.

Bytes 1-6 of the command buffer contain the 3270 datastream information (aid byte, cursor position) followed by up to 120 bytes of input data.

For a user not in dynamic panel mode, the buffer will contain the aid values followed by the data received from the 120 bytes command input area.

For a user in dynamic panel mode, which contains more than one unprotected field, the buffer area will contain data from all modified fields with appropriate embedded 'set buffer address' commands.

If bytes 3-5 of the buffer contain X'115B6B', the input is from the dynamic panel command input area only; the user did not enter any data in the single digit command area against each application. If any other address is present for a dynamic panel mode user, the command field will be present further along the buffer.

	TPEXIT01		Call code 11

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	P	A	Address of command area as typed by user.
BUFL	R	F	Always set to 126 bytes.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UCTL	W	F	Value of user field associated with user.
Note			

TPEXIT01			Call code 12

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	P	A	Address of the command area after removal of SESSCHAR.
BUFL	R	F	Always set to 126 bytes, first 6 are screen control.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session to be switched out from.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (if no VTERMs, ACBNAME of MULTSESS).
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UFLD	W	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.

Note

TPEXIT01			Call code 13

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (if no VTERMs, ACBNAME of MULTSESS).
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UFLD	W	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.
Note			

TPEXIT02	Call code 21 - 2D

Reentrancy	Reentrant, reusable.	
When called	**21**	TPNSESS - New session requested with an application which does not require the use of virtual terminals.
	22	TPVSCIP - A session has terminated. The MULTSESS SCIP exit has been driven with an UNBIND request.
	23	Session termination, usually in error. The MULTSESS NSEXIT exit has been driven.
	24	A TERMSESS command was issued to terminate a session, but VTAM posted a nonzero return code in response to the TERMSESS macro.
	25	A FORCE command was issued. VTAM posted a nonzero return code in response to a TERMSESS macro.
	26	Request to start a new session has been rejected. Possible reasons include: • All pooled ACBs in use • Use of specified VTERM not allowed • INQUIRE APPSTAT failed. • Application not active, or not accepting logons. • VTAM posted nonzero return code in response to a REQSESS macro.
	27	Session request for a CONNECT-ONLY type application.
	28	New session requested with an application requiring the use of a virtual terminal. The virtual terminal allocated by MULTSESS is a unique (non-VPOOL) ACB, chosen from those named on the VTERM statement(s) in the user's directory entry.
	29	New session requested with an application requiring the use of a virtual terminal. The virtual terminal ACB has been allocated from a pool.
	2A	User switching into session. This may be a new session or the user may be switching back to an existing session. For new sessions, this exit call will be made in addition to the session initiation call (21, 28 or 29).
	2B	When a user switches out of session, either temporarily because he has entered his switch character (or ATTN), or because the session was terminated by a normal application logoff sequence.
	2C	Session termination requested using a TERMSESS command (or option T entered on the dynamic panel).
	2D	Session termination requested using a TERMCOND command.

TPEXIT02		Call code 21 - 2D

Suggested uses	**21**	Validate user authority to access the application. Gather statistical information about application use.
	22	Statistical information about application access.
	23 to 25	Statistical information gathering.
	26	Provide user specific error messages. Statistical information gathering.
	27	Check that the user is allowed access to the requested application. Gather statistical information.
	28	Check user is authorized to access the application. Gather statistical information. Change the vterm ACB name to be used for this session.
	29	Check user is authorized to access the application. Gather statistical information. Request MULTSESS to allocate a different ACB from the pool; see notes on next page.
	2A	Send data to the terminal to be intercepted by a hardware monitor. Gather statistical information.
	2B	Send data to the terminal to be intercepted by a hardware or network monitor. Gather statistical information.
	2C	Stack a RUN command to invoke a 'logoff script' to clean up the session. Reject the session termination request. Gather statistical information.
	2D	Stack a RUN command to invoke a 'logoff script' to clean up the session. Reject the session termination request. Gather statistical information.

TPEXIT02	Call code 21 - 2D

Return codes	**21**	R15 = 0 - continue with session request. 4 - disallow session request.
	22 **to** **26**	Ignored.
	27 **and** **28**	R15 = 0 - Allow session request. 4 - Disallow session request.
	29	R15 = 0 - Allow the session. 4 - Select alternative ACB from pool. 8 - Disallow the session.
	2A	Ignored.
	2B	Ignored.
	2C	R15 = 0 - Continue with TERMSESS execution. 4 - Discard TERMSESS command.
	2D	R15 = 0 - Continue with TERMCOND execution. 4 - Discard TERMCOND command.

Notes	EXIT02 is called when a new session is requested or a session terminates. A sample EXIT02 is supplied in the sample file.

TPEXIT02			Call code 21

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	P	A	Address of user CINIT data.
BUFL	W	F	Length of user CINIT data.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (if no VTERMs, then ACBNAME of MULTSESS).
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UFLD	C	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.

Note	R15 set on exit = 0 - session allowed. 4 - session not allowed.

TPEXIT02			Call code 22

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (if no VTERMs, ACBNAME of MULTSESS).
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UFLD	R	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.
2NOT	R	XL4	Number of transactions.
2LRT	R	XL4	Last response time (hundredths of a second).
2ART	R	XL4	Aggregate response time (hundredths of a second).
2TRT	R	XL4	Total response time (hundredths of a second).
2HRT	R	XL4	Highest response time (hundredths of a second).
2THR	R	XL4	Time highest response time occurred (hundredths of a second).

Note   TPEXIT02 - call code 22 - can run from mainline code. Ensure that any processing for call code 22 cannot abend or hang.

	TPEXIT02			Call code 23

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (if no VTERMs, ACBNAME of MULTSESS).
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UFLD	R	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.
2NOT	R	XL4	Number of transactions.
2LRT	R	XL4	Last response time (hundredths of a second).
2ART	R	XL4	Aggregate response time (hundredths of a second).
2TRT	R	XL4	Total response time (hundredths of a second).
2HRT	R	XL4	Highest response time (hundredths of a second).
2THR	R	XL4	Time highest response time occurred (hundredths of a second).

Note

	TPEXIT02			Call code 24

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (if no VTERMs, ACBNAME of MULTSESS).
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UFLD	R	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.

Note

TPEXIT02			Call code 25

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (if no VTERMs, ACBNAME of MULTSESS).
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UFLD	R	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.

Note

TPEXIT02			Call code 26

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (if no VTERMs, ACBNAME of MULTSESS).
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UFLD	R	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.

Note

	TPEXIT02			Call code 27

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	P	A	Address of user CINIT data.
BUFL	W	F	Length of user CINIT data.
TERM	R	CL8	VTAM node name of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (if no VTERMs, then ACBNAME of MULTSESS).
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.

Note	R15 set on exit =	0 - session allowed
		4 - session not allowed

TPEXIT02			Call code 28

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	P	A	Address of user CINIT data.
BUFL	W	F	Length of user CINIT data.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	W	CL8	VTERM name (if no VTERMs, then ACBNAME of MULTSESS). (Readable only if EXlTVUSE is set, ie value = 'R').
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect. EXITVUSE is also passed here.
UFLD	C	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.

Note   R15 set on exit =   0 - session allowed.
                                               4 - session not allowed.

TPEXIT02			Call code 29

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	P	A	Address of user CINIT data.
BUFL	W	F	Length of user CINIT data.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (if no VTERMs, then ACBNAME of MULTSESS).
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect EXITVUSE is also passed here.
UFLD	C	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.

Note	R15 set on exit = 0 - session allowed. 4 - VTERM not allowed. 8 - session not allowed.

TPEXIT02			Call code 2A

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	P	A	Address of RPL for exit use.
BUFL	R	F	Always set to 4 bytes.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (if no VTERMs, then ACBNAME of MULTSESS).
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UFLD	W	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.
2CID	R	CL4	CID contents from HPO RPL.
2ACB	P	F	Address of HPO ACB.
2F1	W	X	Flag byte 1.

Note

TPEXIT02			Call code 2B

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	P	A	Address of RPL for exit use.
BUFL	R	F	Always set to 4 bytes.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (if no VTERMs, then ACBNAME of MULTSESS).
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UFLD	W	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.
2CID	R	CL4	CID contents from HPO RPL.
2ACB	P	F	Address of HPO ACB
2F1	W	X	Flag byte 1

Note	TPEXIT02 - call code X'2B' - can run from mainline code. Ensure that any processing for call code 2B cannot abend or hang.

TPEXIT02			Call code 2C

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (if no VTERMs, then ACBNAME of MULTSESS).
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UFLD	W	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.

Note   R15 set on exit = 0 - allow termsess
                                     4 - disallow termsess

	TPEXIT02			Call code 2D

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (if no VTERMs, then ACBNAME of MULTSESS).
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UFLD	W	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.

Note   R15 set on exit = 0 - allow termcond.
                                        4 - disallow termcond.

| **TPEXIT03** | **Call code 31 - 32** |

Reentrancy	**01**	Reentrant, reusable.	
When called	**31**	TPSUBT	- Just before a subcommand is about to be scanned and executed. EXITBUFA points to a 120 byte buffer area containing the command.
	32	TPSUBT	- Just before a null subcommand is to be ignored. EXITBUFA points to an empty 120 byte buffer. The following may occur:

- if the user has hit ATTN in session to cause a switch

  or

- the user has pressed the <Enter> key, without typing any input.

Suggested uses	Validate use of the command.
	Gather statistical information.
	Modify or replace the entered command with a single or multiple commands.
Return codes	R15 = 0 - Input buffer not modified. 4 - Input buffer modified
Notes	The input buffer, pointed to by EXITBUFA, will be empty (call code 32), or will contain a single command which MULTSESS is about to execute.
	If the user typed multiple commands, separated by his CMDCHAR, this exit will be called multiple times as each command is about to be executed.
	The exit may modify the buffer to change or completely replace the command text. The single command may be replaced with multiple commands, separated by the user's command separator character, supplied in EXITCCHR
	If the buffer is modified, this exit will be re-invoked as each of the new/amended commands is about to be executed.

	TPEXIT03			Call code 31

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	P	A	Address of command input buffer.
BUFL	R	F	Always set to 120 bytes.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UCTL	W	F	Value of user field associated with user.

Note   R15 set on exit = 0 - command not modified.
                                  4 - command modified.

If a command is modified, this exit will be called again, more than once, if the command character is used in the command line.

	TPEXIT03			Call code 32

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	P	A	Address of command input buffer.
BUFL	R	F	Always set to 120 bytes.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UCTL	W	F	Value of user field associated with user.

Note   R15 set on exit = 0 - command not modified.
                                    4 - command modified.

If a command is modified, this exit will be called again, more than once, if the command character is used in the command line.

Exit called when switching back to MULTSESS mode and no command was entered (e.g. SESSCHAR only or ATTN).

TPEXIT04	Call code 41

Reentrancy	**01**	Reentrant, reusable.
When called	TPPRINT -	Whenever MULTSESS PRINT command issued, that is, whenever a PRINT command is issued requesting a hardcopy snapshot of an application screen image.
Suggested uses		Write hardcopy of screen image to spool or a file.
Return codes	R15 = 0	- MULTSESS will issue the message, MS0265, indicating the print was successful.
	4	- MULTSESS will not issue a message.
Notes		When a PRINT command is issued, MULTSESS captures the current screen image from the requested session and passes it to EXIT04 for final formatting and routing.
		If EXIT04 is not enabled, PRINT commands will not be accepted.
		The format of the PRINT command is:
		PRINT option alias (options
		The single alphanumeric digit specified for option will be passed to the exit in the EXITOPT field of the standard entry parameter list.
		The address of the variable length options string will be passed to the exit in the EXITPARM field of the standard entry parameter list.
		A sample EXIT04 is supplied in the sample library (file 7 of the distribution tape) that routes hardcopy images to the JES2 spool or a disk file. The sample exit recognizes an option of **S** for output to spool, **F** for output to a file, or **V** for a VTAM printer.

	TPEXIT04			Call code 41

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	R	A	Address of a screen buffer image.
BUFL	R	F	Length of a screen buffer image
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (ACBNAME of MULTSESS, if no VTERMs).
ROWS	R	X	Number of rows in screen.
COLS	R	X	Number of columns in screen.
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
OPT	R	X	Option entered on the PRINT command.
UFLD	W	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.
PARM	R	A	Address of user options, if any.

Notes   R15 set on exit = 0 - MS0265 to be issued.
                          4 - MS0265 not to be issued.

Used to format the print buffer and send to a specified destination, e.g. SYSOUT of a dataset.

TPEXIT05	Call code 51 - 52

Reentrancy	Non-reentrant, reusable.

When called	**51**	TPCP1	- Called when terminal data has been entered from the keyboard and is about to be sent on to the application.
	52	TPATR02	- Called when data arrives from ATP and is about to be sent to an application the user may or may not be in session.

Suggested uses	Modify application inbound data. Compress data to be sent over a cross-domain link. Return the user to MULTSESS mode even if SESSCHAR not entered. Do not return user to MULTSESS even if SESSCHAR has been entered.

Return codes	R15 = 0 - MULTSESS will process the data buffer as normal (for call 51 only) (scan for SESSCHAR, MSKEY etc., if applicable). 4 - Send the data to the application immediately. MULTSESS will bypass its scan for SESSCHAR etc. 8 - Return user to MULTSESS mode. The input buffer is discarded. 16 - Return user to MULTSESS. A MULTSESS command has been placed in the buffer.

Notes	The input buffer, containing the inbound application data, is pointed to by EXITBUFA and is of length EXITBUFL. The exit may modify the contents of the buffer and change its length. Buffers from ATP may not be increased in length. Buffers inbound from a terminal may be increased in length up to the value specified in the inbound RUSIZE for the terminal or the MAXIMUM-RUSIZE startup parameter, whichever is the least. Be aware that first-in-chain (FIC) and middle-in-chain (MIC) RUs will already be at maximum RUSIZE and must not be increased in length. When manipulating the size of the buffer, the new length must be put in EXITBUFL at exit termination. When forcing a switch to MULTSESS mode (call code 51, rc 4 or 8) the inbound application data will be discarded and **not** sent to the application. When forcing a switch to MULTSESS, a MULTSESS command (e.g. a switch to another session) may be stacked on behalf of the user for immediate execution. Place the command (or command string delimited by the user's CMDCHAR) in the first 120 bytes of the buffer (EXITBUFA). Once enabled, this exit will be called for every send for every user. Be aware of the amount of extra overhead your exit routine is introducing. A sample EXIT05 is supplied in the sample library.

	TPEXIT05			Call code 51

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	P	A	Address of data buffer from terminal.
BUFL	W	F	Length of data buffer.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (ACBNAME of MULTSESS, if no VTERM).
ROWS	R	X	Number of rows in primary screen size.
COLS	R	X	Number of columns in primary screen.
ROWA	R	X	Number of rows in alternate screen size.
COLA	R	X	Number of columns in alternate screen.
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
CHN	R	X	VTAM chaining value of data from RPL.
UFLD	W	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.

Note   R15 set on exit =   0 - Continue with SESSCHAR scan.
                                     4 - Continue without SESSCHAR scan.
                                     8 - Enter MULTSESS mode - with no command.
                                    12 - Enter MULTSESS mode - with a command.
          Data length should not be enlarged beyond RUSIZE allowed.
          MULTSESS command maximum length is 120 bytes.

TPEXIT05			Call code 52

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	P	A	Address of data to be sent to application.
BUFL	W	F	Length of data.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (ACBNAME of MULTSESS, if no VTERMs).
ROWS	R	X	Number of rows in primary screen size.
COLS	R	X	Number of columns in primary screen.
ROWA	R	X	Number of rows in alternate screen size.
COLA	R	X	Number of columns in alternate screen.
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
CHN	R	X	VTAM chaining value of data from RPL.
UFLD	W	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.

Note	R15 set on exit = 0 - Continue with SESSCHAR scan.
	4 - Continue without SESSCHAR scan.
	8 - Enter MULTSESS mode - with no command.
	12 - Enter MULTSESS mode - with a command.
	Data length should not be enlarged in case the RUSIZE is exceeded.

TPEXIT06	**Call code 61**

Reentrancy	Non-reentrant, reusable.
When called	TPCP1 - Application data outbound to terminal or ATP processor.
Suggested uses	Compress data before transmission. Examine and modify outbound data. Notify user of data received on a background.

Return codes	0 - normal return
	4 - data to be disregarded (inactive sessions only).
	
	If a non-zero return code is passed back in register 15, the data will be 'thrown away' if **both** the following are true:
	
	    the user is not currently in the session,
	    there is not an ATP script active on the session.

Notes	The exit is called immediately the data is received from the application. The user may not be in the session, or an ATP script may be active for the session. The contents of the buffer may be modified and the length altered. When changing the buffer length, the same precautions should be observed as described for EXIT05. Once enabled, this exit will be invoked for all data on all sessions. Beware of the extra overhead introduced by your exit routine. This facility is particularly useful with applications such as PROFS to suppress unwanted updates to the on-screen clock while the user is not in the session. It is the responsibility of the customer to ensure that the integrity of chained data is maintained. If one element of a chain is discarded (e.g. FIC), so must all other elements of the chain. MULTSESS supplies chaining information in the EXITCHN field of the standard exit parameter list.

TPEXIT06				Call code 61

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	P	A	Address of data received from application.
BUFL	W	F	Length of data.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session.
ALIA	R	CL8	Alias name.
NODE	R	CL8	Node name.
VTRM	R	CL8	VTERM name (ACBNAME of MULTSESS, if no VTERMs).
ROWS	R	X	Number of rows in primary screen size.
COLS	R	X	Number of columns in primary screen.
ROWA	R	X	Number of rows in alternate screen size.
COLA	R	X	Number of columns in alternate screen.
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
CHN	R	X	VTAM chaining value of data from RPL.
UFLD	W	F	Value of user field associated with session.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field for ADT for current session.

Note	R15 set on exit = 0 - process data further. 4 - if session not active session, throw data away. Data length should not be enlarged in case the RUSIZE is exceeded causing problems.

TPEXIT07	Call code 71 - 75

Reentrancy	Reentrant, reusable.		
When called	**71**		TPLOGON - MULTSESS logon time, if the keyword EXIT is coded in the password field in the user's directory entry.
			MULTSESS supplies standard interface routines for validating userid and password against the major proprietary security systems. These are invoked by coding the appropriate keyword in the password field of a USER statement in the MULTSESS directory of users.
			This exit may be used if your installation uses a security system other than those supported, or if you wish to invoke alternative validation techniques against the supported proprietary databases.
			EXIT07 is only called with entry code 71 for users having the keyword EXIT in place of a password in their directory entry.
			The keyword EXIT may be optionally suffixed by a single alphanumeric character. This will be passed to the exit in the EXITOPT field of the entry parameter list.
		Note	This exit is invoked **instead** of the supplied interface routines. You may issue calls to your proprietary security database to reproduce and enhance the standard validation.
			If a user is reconnecting, this exit will be called immediately, followed by exit 72. If exit 71 has created an EXITUCTL, this will be passed to exit 72 in the EXITBUFA field.
	72	TPLOGON	- when a user reconnects to MULTSESS.
	73	TPDISCON TPCLSDST	- when a user disconnects from MULTSESS. (If customization fix 11 is applied, call code 73 TPCLSDST will be changed to 75)
	74	TPCLSDST	- when a user logs off from MULTSESS.
	75	TPCLSDST	- when a user powers down his terminal (only if customization fix 11 is applied).

TPEXIT07	Call code 71 - 75

Suggested uses	**71**	Security validation in place of the supplied proprietary security system interface routines.
		Modify userid, password or new password.
		Supply/modify user profile name (EXITPROF).
		Save information from the EXITUCTL field, such as the user's ACF2 LIDREC, for later use in other exits.
	72	Gather statistical information.
		Modify user data, pointed to by EXITUCTL which was set up when the user was last connected, for example the user may have reconnected on a different terminal.
		Free off data set up by a previous call with entry code 71, before it was realized the user was reconnecting.
	73, 74,	Gather statistical information.
	75	Log a user off when he powers down his terminal (if customization fix 11 is applied).

Return codes	**71**	R15 =	0 -	Logon allowed.
			4 -	Logon validation failed. Cursor will be placed in the userid field of the logo.
			8 -	Logon validation failed. Cursor will be placed in the password logo field.

Note

Issuing a return code of 4 cancels the logon request. The password field is cleared and the cursor is positioned in the userid field of the logo.

Issuing a return code of 8 indicates that a valid userid has been entered with an invalid password. The userid is left in the logo. The password field is cleared and the cursor positioned ready for entry of the correct password. It is the responsibility of the customer to issue an appropriate message to the terminal user using the EXITPUT macro.

	72 **to** **75**	Ignored.

TPEXIT07			Call code 71

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	R	A	Userid length (1 byte), userid (8 bytes), password length (1 byte), password (8 bytes), newpass length (1 byte), newpass (8 bytes).
BUFL	R	F	Always set to 27 bytes.
TERM	R	CL8	VTAM nodename of terminal.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	W	CL8	Profile can be changed from that in directory.
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Only PFK5, PFKM and LU2 are set, if applicable.
OPT	R	X	Character appended to password 'EXIT' in directory.
UCTL	C	F	Value of user field associated with user.
SECR	R	CL8	Security field from directory of userid entered.
7PWD	C	AL1,CL8	Random password returned from EXIT07.

Note	R15 set on exit = 0 - allow logon.

                                       4 - disallow logon (cursor to userid).
                                       8 - disallow logon (cursor to password).

If user is reconnecting, exit 72 will be called later. Exit 71 is not called when CONNECT-RECONNECT = YES is being actioned for a user.

	TPEXIT07			Call code 72

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the getmain routine.
STCK	R	A	Address of the user command stack routine.
BUFA	R	A	UCTL field from CONNECT user who originally logged on.
BUFL	R	F	Always set to 4 bytes.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UCTL	W	F	Value of user field at disconnect time.

Note	This exit is called for all users, whether or not EXIT is specified as the password in the user's directory entry.

TPEXIT07			**Call code 73**

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the getmain routine.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UCTL	W	F	Value of user field associated with user.

Note	This exit is called for all users, whether or not EXIT is specified as the password in the user's directory entry.

	TPEXIT07			Call code 74

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UCTL	R	F	Value of user field associated with user.

Note	This exit is called for all users, whether or not EXIT is specified as the password in the user's directory entry.

TPEXIT07			**Call code 75**

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the getmain routine.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UCTL	W	F	Value of user field associated with user.

Note	This exit is called for all users, whether or not EXIT is specified as the password in the user's directory entry.
	Call code 75 applies only if customization fix 11 is applied.

TPEXIT08	Call code 82 - 84

Reentrancy	Reentrant, reusable			
When called	**82**	TPPANEL	-	Dynamic panel build time. Called for each entry in the ADT matching this user's session statements, in response to a PANEL ON command.
	83	TPQUERY	-	Called for each entry in the ADT matching this user's session statements, in response to a QUERY command.
	84	TPNSESS	-	Called when a session command has been matched with an ADT entry to determine whether this user is allowed to access this application.
Suggested uses	**82**	Suggested uses:		
		exclude applications from the MULTSESS dynamic panel, based on the contents of a security database.		
		prevent duplicate entries appearing on the dynamic panel application menu.		
	83	Exclude applications from the output of the QUERY * command. Prevent duplicate entries being listed by the QUERY *command.		
	84	To determine whether the user is to be allowed a session with the application.		

TPEXIT08	Call code 82

Return code	82	0 - This entry will be included on the application menu.
		4 - This entry will not be included on the application menu.

The application menu area of the MULTSESS dynamic panel is built by reference to the SESSION statements in the user's directory entry. For SESSION statements specifying generic application names (e.g. SESSION CIC*, SESSION *), the ADT is referenced to extract each application matching the specified generic name. By default, each matching entry is included on the user's dynamic panel menu For further details about the MULTSESS dynamic panel, please refer to *The Dynamic panel* on page 3.5.

This exit call enables applications which would otherwise be included on the user's application menu to be selectively excluded, for example by reference to a security database.

This exit will be called as each application is about to be placed into the user's application menu. The return code from each exit call indicates to MULTSESS whether the application which was the subject of this call is to be included on the user's menu.

This exit may be used to exclude duplicate entries from the application menu. For instance, if a user has a directory entry:

```
SESSION CICSA POOL1 * * SCRIPT1
SESSION CICSB POOL2 * * SCRIPT2
SESSION *
```

the final SESSION statement will cause all applications in the ADT to be included on the menu. However CICSA and CICSB will already have been included by virtue of the preceding SESSION statements. This exit could be used to suppress the duplicate entries from the dynamic panel menu. For customers who have application access rights stored in a security database or file, use of this exit enables totally personalized application menus to be produced while eliminating maintenance of the MULTSESS directory of users. All users may share a directory entry specifying:

```
SESSION *
```

with the applications which appear on the menu being restricted by this exit at panel build time.

To prevent users typing a SESSION command into the command input area to access an application not appearing on the panel, the code used here for call code 82 may be shared within EXIT08 by call code 84 to validate access rights again at session initiation time.

TPEXIT08	Call code 82 - 83

Return code	**82**	To avoid the overhead of continually accessing your security database for every call of the exit (i.e. for every possible application), it is recommended that the security information be retrieved once only and held in a storage area pointed to by the EXITUCTL field. This may be done on the first call to this exit for a user, or in EXIT07 (call code 71) when the user first logs on to MULTSESS.
		On each call to this exit, the EXITSECR field of the entry parameter list contains up to 8 bytes of data, as specified in the SECURITY = parameter of the ADT definition for the application which is the subject of this call.
		The customer may specify any data for the SECURITY parameter, but would typically contain a pointer into the user's security database record where access information for this application is held. For instance, ACF2 users may use the SECURITY parameter to specify the LIDREC offset for the application and the value to test for. This exit could use this information to test the user's LIDREC to determine whether to include the application on the dynamic panel.
Return code	**83**	0 - Entry will be included in the output from QUERY *. 4 - Entry is not included in the output from QUERY *.
		This exit is called when the user issues a QUERY * command to list the applications which he is allowed to access.
		The output for QUERY * is produced in much the same way as the dynamic panel application menu is built, by reference to the SESSION statements in the user's directory entry and, for generic application names, the ADT. The QUERY * command is more fully described in the MULTSESS User Reference Manual.
		This exit is called once for each application matched in the directory/ADT lookup for inclusion in the output from the QUERY * command.
		If call code 82 has been utilized to restrict the applications appearing on the user's dynamic panel menu, this exit should be used to restrict the output of the QUERY * command to match.
		Typically, this exit call will use the same processing logic as call code 82 to accept or reject an application. Please refer to the description of call code 82 for further details.

TPEXIT08	Call code 84

Return code	84	0	-	This ADT entry allowed and the session may proceed.
		4	-	This ADT entry may not be used. MULTSESS will continue to search the ADT for another matching entry.

This exit is called when the user requests MULTSESS to start a new application session and an application has been chosen from the ADT which matches the symbolic name specified (or defaulted) by the user.

MULTSESS searches the ADT 'top-down' looking for a matching symbolic name with which to start a new session. This exit may reject the ADT entry selected by MULTSESS, in which case the search will continue for another matching ADT entry, at which time this exit will be re-invoked. If the end of the ADT is reached and all matching entries have been rejected, the session will be disallowed. The user will receive an error message indicating that the application has not been defined to MULTSESS (i.e. does not exist - at least as far as this particular user is concerned).

If call code 82 has been utilized to restrict the applications that appear on the user's dynamic panel menu, this exit should be used to ensure the user does not attempt a session with an application not listed on his menu by typing a SESSION command into the panel command input area.

Typically, this exit call will use the same processing logic as call code 82 to accept or reject an application. Please refer to the description of call code 82 for further details.

TPEXIT08			**Call code 82**

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	R	A	Pointer to the session statement from the directory, each 8 bytes represents the five possible operands.
BUFL	R	F	Always set to 40 bytes.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session to be switched out from.
NODE	R	CL8	Node name.
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.

Note	R15 set on exit = 0 - Use this entry.
	4 - Do not use this entry.

TPEXIT08			Call code 83

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
BUFA	R	A	Pointer to the session statement from the directory, each 8 bytes represents the five possible operands.
BUFL	R	F	Always set to 40 bytes.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session to be switched out from.
NODE	R	CL8	Node name.
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.

Note   R15 set on exit =   0 - Use this entry.
                                   4 - Do not use this entry.

TPEXIT08			Call code 84

Parameter	Value Indicator	Format	Contents
CONS	R	A	Address of the console write routine.
PLST	R	A	Parm list value used by exit subroutine calls.
SEND	R	A	Address of the user message send routine.
GETM	R	A	Address of the GETMAIN routine.
STCK	R	A	Address of the user command stack routine.
TERM	R	CL8	VTAM nodename of terminal.
USER	R	CL8	Userid.
LOGM	R	CL8	Logmode of terminal used to connect to MULTSESS.
PROF	R	CL8	Current profile name.
SYM	R	CL8	Symbolic name of session to be switched out from.
NODE	R	CL8	Node name.
CCHR	R	C	Current command character in use.
SESC	R	C	SESSCHAR in use.
MSKY	R	C	MSKEY in use.
FLAG	R	X	Various user options currently in effect.
UCTL	W	F	Value of user field associated with user.
SECR	R	CL8	Security field from ADT for current session.

Note   R15 set on exit =   0 - Use this entry.
                                         4 - Do not use this entry.

Appendix A - Sample zaps

Introduction

This appendix provides the following three examples of ZAPS applied to the MULTSESS load library using the IBM utility AMASPZAP.

- a ZAP to customize the MULTSESS logo.

- a ZAP to change the command classes.

- a ZAP to change the alias created by the dynamic panel from PFK1, PFK2, etc.

Example one

```
* THIS SAMPLE ZAP CUSTOMIZES THE MULTSESS LOGO
* REFER TO TNL27001 FOR FURTHER DETAILS.
* MULTSESS HPO V1.1 OR ABOVE
* FIX LEVEL 750 OR ABOVE REQUIRED
*
NAME TPLOG
VER 0731 E4E2C5D9C9C47E7E7E6E          : DC C'USERID===>
VER 0740 00000000000000115BF71DF8      : DC XL8'00' INPUT AREA
VER 074D D7C1E2E2E6D6D9C47E7E7E6E      : DC C'PASSWORD===>
VER 075E 00000000000000115C4D1DF8      : DC XL8'00' INPUT AREA
VER 076B D5C5E6D7C1E2E27E7E7E6E        : DC C'NEWPASS===>'
VER 077B 00000000000000115CE21DF8      : DC XL8'00' INPUT AREA
VER 0788 D7C6D2F140C6D6D940C8C5D3D7    : DC C'PFK1 FOR HELP'
REP 0731 E4E2C5D9C9C46E6E6E6E          : DC C'USERID>>>>'
REP 0740 000000000000115BF51DF80000    : DC XL6'00' INPUT AREA
REP 074D D7C1E2E2E6D6D9C46E6E6E6E      : DC C'PASSWORD>>>>>'
REP 075E 000000000000115C4B1DF80000    : DC CXL6'00' INPUT AREA
REP 076B 404040404040404040404040      : DC CL11' '
REP 077B 115C5A1DF80000000000000000    : REMOVE INPUT AREA
REP 0788 D7C6D2F140C6D6D940C8C5D3D7    : DC C'PFK1 FOR HELP'
IDRDATA TNL27001
*
NAME TPMSEND
VER 0546 D207                          : 8 BYTE USERID MOVE
REP 0546 D205                          : 6 BYTE USERID MOVE
IDRDATA TNL27001
*
NAME TPLOGON
VER 174E D207                          : 8 BYTE USERID MOVE
REP 174E D205                          : 6 BYTE USERID MOVE
IDRDATA TNL27001
*
NAME TPCPDATA
VER 17E2 95F1                          : PFK1 FOR HELP
VER 17EA 95C1                          : PFK13 FOR HELP
VER 17F2 95F3                          : PFK3 FOR LOGOFF
VER 17FA 95C3                          : PFK15 FOR LOGOFF
IKJ52500I END OF DATA
```

Example two

```
* THIS ZAP IS AN EXAMPLE OF HOW TO CHANGE THE
* COMMAND CLASSES THAT ARE ENTITLED TO USE
* SOME OF THE COMMANDS OR SUB-COMMANDS
* REFER TO TNL27002 FOR MORE DETAILS
* MULTSESS HPO V1.1 OR ABOVE
* FIX LEVEL 750 OR ABOVE REQUIRED
*
NAME TPECMD
VER 0015 C7              : CLASS G FOR ASTERISK
VER 0029 C2              : CLASS B FOR ATPCMD
VER 003D C3              : CLASS C FOR ATPDIR
VER 0051 C7              : CLASS G FOR ATPVAR
VER 0065 C7              : CLASS G FOR ATTN
VER 0079 C2              : CLASS B FOR CONSOLE
VER 008D C7              : CLASS G FOR COPY
VER 00A1 C3              : CLASS C FOR DEFINE
VER 00B5 C3              : CLASS C FOR DIRECT
VER 00C9 C7              : CLASS G FOR DISCON
VER 00DD C3              : CLASS C FOR DISPLAY
VER 00F1 C7              : CLASS G FOR ECHO
VER 0105 C1              : CLASS A FOR EXIT
VER 0119 C1              : CLASS A FOR FIX
VER 012D C2              : CLASS B FOR FORCE
VER 0141 C7              : CLASS G FOR HELP
VER 0155 C7              : CLASS G FOR IMAGE
VER 0169 C3              : CLASS C FOR LLOAD
VER 017D C7              : CLASS G FOR LOGOFF
VER 0191 C7              : CLASS G FOR LOGON
VER 01A5 C7              : CLASS G FOR MESSAGE
VER 01B9 C7              : CLASS G FOR MORE
VER 01CD C3              : CLASS C FOR MSGAPP
VER 01E1 C7              : CLASS G FOR PANEL
VER 01F5 C3              : CLASS C FOR PLOAD
VER 0209 C7              : CLASS G FOR PRINT
VER 021D C7              : CLASS G FOR PROFILE
VER 0231 C7              : CLASS G FOR QUERY
VER 0245 C7              : CLASS G FOR RESPONSE
VER 0259 C7              : CLASS G FOR RUN
VER 026D C7              : CLASS G FOR SESSION
VER 0281 C7              : CLASS G FOR SET
VER 0295 C7              : CLASS G FOR STACK
VER 02A9 C3              : CLASS C FOR START
VER 02BD C3              : CLASS C FOR STOP
VER 02D1 C7              : CLASS G FOR TERMCOND
VER 02E5 C7              : CLASS G FOR TERMRUN
VER 02F9 C7              : CLASS G FOR TERMSESS
VER 030D C7              : CLASS G FOR TEST
VER 0321 C1              : CLASS A FOR TPTRACE
VER 0335 C1              : CLASS A FOR VERSION
VER 0349 C3              : CLASS C FOR VPOOL
VER 035D C7              : CLASS G FOR VTERM
VER 0371 C7              : CLASS G FOR WAIT
```

```
*
REP 01CD C7               : CLASS G FOR MSGAPP
IDRDATA TNL27002
*
 CHANGE AUTHORITY ON SUB-COMMANDS
*
NAME TPATPCMD
VER 0535 C2               : CLASS B FOR ATPCMD ABEND
VER 0571 C7               : CLASS G FOR ATPCMD DISPLAY
VER 055D C7               : CLASS G FOR ATPCMD RESET
VER 0521 C2               : CLASS B FOR ATPCMD SHUTDOWN
VER 0549 C2               : CLASS B FOR ATPCMD TRACE
VER 05B1 C2               : CLASS B FOR ATPCMD TRACE ALL
VER 059D C2               : CLASS B FOR ATPCMD TRACE OFF
VER 0589 C2               : CLASS B FOR ATPCMD TRACE ON
IDRDATA TNL27002
*
NAME TPATPVAR
VER 07E5 C7               : CLASS G FOR ATPVAR DELETE
VER 07F9 C7               : CLASS G FOR ATPVAR QUERY
VER 07D1 C7               : CLASS G FOR ATPVAR SET
IDRDATA TNL27002
*
NAME TPDISCON
VER OCEF C3               : CLASS C FOR DISCON USERID
IDRDATA TNL27002
*
NAME TPDISPLA
VER 05B5 C3               : CLASS C FOR DISPLAY PANEL
VER 05C9 C3               : CLASS C FOR DISPLAY VPOOLS
IDRDATA TNL27002
*
REP 05B5 C7               : CLASS G FOR DISPLAY PANEL
IDRDATA TNL27002
*
NAME TPEXIT
VER 04BD C1               : CLASS A FOR EXIT ENABLE
VER 04D1 C1               : CLASS A FOR EXIT DISABLE
VER 04E5 C1               : CLASS A FOR EXIT QUERY
IDRDATA TNL27002
*
NAME TPIMAGE
VER OFE5 C7               : CLASS G FOR IMAGE ON
VER OFF9 C7               : CLASS G FOR IMAGE OFF
VER 100D C7               : CLASS G FOR IMAGE SEND
VER 1021 C7               : CLASS G FOR IMAGE QUERY
VER 1035 C7               : CLASS G FOR IMAGE VIEW
VER 1049 C7               : CLASS G FOR IMAGE DELETE
VER 105D C3               : CLASS C FOR IMAGE GET
*
REP 105D C7               : CLASS G FOR IMAGE GET
IDRDATA TNL27002
```

```
*
NAME TPMESSAG
VER 0685 C3            : CLASS C FOR MESSAGE ALL
IDRDATA TNL27002
*
NAME TPANEL
VER 1439 C7            : CLASS G FOR PANEL ON EXIT
VER 13FD C7            : CLASS G FOR PANEL ON NOMSG
VER 144D C7            : CLASS G FOR PANEL ON NOEXIT
VER 1425 C7            : CLASS G FOR PANEL ON NOPFK
VER 1411 C7            : CLASS G FOR PANEL ON PFK
VER 1461 C7            : CLASS G FOR PANEL ON UPDATE
VER 1475 C7            : CLASS G FOR PANEL ON NOUPDATE
VER 13E9 C7            : CLASS G FOR PANEL ON MSG
VER 1395 C7            : CLASS G FOR PANEL MSGON
VER 13A9 C7            : CLASS G FOR PANEL MSGOFF
VER 13BD C7            : CLASS G FOR PANEL MSGSON
VER 13D1 C7            : CLASS G FOR PANEL MSGSOFF
VER 1355 C7            : CLASS G FOR PANEL ON
VER 1369 C7            : CLASS G FOR PANEL OFF
VER 137D C7            : CLASS G FOR PANEL PFKSET
IDRDATA TNL27002
*
NAME TPPLOAD
VER 076D C3            : CLASS C FOR PLOAD ALL
IDRDATA TNL27002
*
NAME TPPROFIL
VER 0539 C7            : CLASS G FOR PROFIL EXECUTE
VER 054D C7            : CLASS G FOR PROFIL LIST
IDRDATA TNL27002
*
NAME TPQUERY
VER 0CB5 C6            : CLASS F FOR ACB INFO ON Q SESS
VER 12A3 C2            : CLASS B FOR Q USERID ALL/*
VER 17F9 C7            : CLASS G FOR Q *
VER 180D C7            : CLASS G FOR Q CONSESS
VER 1821 C2            : CLASS B FOR Q MAXUSERS
VER 1835 C7            : CLASS G FOR Q NAMES
VER 1849 C2            : CLASS B FOR Q NET
VER 185D C7            : CLASS G FOR Q PFK (ALL PFKS)
VER 1871 C7            : CLASS G FOR Q PFK1
VER 1885 C7            : CLASS G FOR Q PFK2
VER 1899 C7            : CLASS G FOR Q PFK3
VER 18AD C7            : CLASS G FOR Q PFK4
VER 18C1 C7            : CLASS G FOR Q PFK5
VER 18D5 C7            : CLASS G FOR Q PFK6
VER 18E9 C7            : CLASS G FOR Q PFK7
VER 18FD C7            : CLASS G FOR Q PFK8
VER 1911 C7            : CLASS G FOR Q PFK9
```

```
VER 1925 C7                   : CLASS G FOR Q PFK10
VER 1939 C7                   : CLASS G FOR Q PFK11
VER 194D C7                   : CLASS G FOR Q PFK12
VER 1961 C7                   : CLASS G FOR Q PFK13
VER 1975 C7                   : CLASS G FOR Q PFK14
VER 1989 C7                   : CLASS G FOR Q PFK15
VER 199D C7                   : CLASS G FOR Q PFK16
VER 19B1 C7                   : CLASS G FOR Q PFK17
VER 19C5 C7                   : CLASS G FOR Q PFK18
VER 19D9 C7                   : CLASS G FOR Q PFK19
VER 19ED C7                   : CLASS G FOR Q PFK20
VER 1A01 C7                   : CLASS G FOR Q PFK21
VER 1A15 C7                   : CLASS G FOR Q PFK22
VER 1A29 C7                   : CLASS G FOR Q PFK23
VER 1A3D C7                   : CLASS G FOR Q PFK24
VER 1A51 C7                   : CLASS G FOR Q SESSCHAR
VER 1A65 C7                   : CLASS G FOR Q MSKEY
VER 1A79 C7                   : CLASS G FOR Q CMDCHAR
VER 1A8D C7                   : CLASS G FOR Q SESSION
VER 1AA1 C2                   : CLASS B FOR Q TASKS
VER 1AB5 C7                   : CLASS G FOR Q TERMINAL
VER 1AC9 C7                   : CLASS G FOR Q TIME
VER 1AC9 C7                   : CLASS G FOR Q TIME
VER 1ADD C1                   : CLASS A FOR Q TRANSACT
VER 1AF1 C7                   : CLASS G FOR Q USERS
VER 1B05 C7                   : CLASS G FOR Q ACTIVE
VER 1B19 C7                   : CLASS G FOR Q NEWS
*
REP 0CB5 C7                   : CLASS G FOR ACB INFO ON Q SESS
IDRDATA TNL27002
*
NAME TPRESPON
VER 07B1 C7                   : CLASS G FOR RESPON CLEAR
VER 07C5 C7                   : CLASS G FOR RESPON LIST
IDRDATA TNL27002
*
NAME TPSET
VER 0D95 C1                   : CLASS A FOR SET DUMP
VER 0DA9 C2                   : CLASS B FOR SET MAXUSERS
VER 0DD1 C7                   : CLASS G FOR SET PFK1
VER 0DE5 C7                   : CLASS G FOR SET PFK2
VER 0DF9 C7                   : CLASS G FOR SET PFK3
VER 0E0D C7                   : CLASS G FOR SET PFK4
VER 0E21 C7                   : CLASS G FOR SET PFK5
VER 0E35 C7                   : CLASS G FOR SET PFK6
VER 0E49 C7                   : CLASS G FOR SET PFK7
VER 0E5D C7                   : CLASS G FOR SET PFK8
VER 0E71 C7                   : CLASS G FOR SET PFK9
```

```
VER 0E85 C7              : CLASS G FOR SET PFK10
VER 0E99 C7              : CLASS G FOR SET PFK11
VER 0EAD C7              : CLASS G FOR SET PFK12
VER 0EC1 C7              : CLASS G FOR SET PFK13
VER 0ED5 C7              : CLASS G FOR SET PFK14
VER 0EE9 C7              : CLASS G FOR SET PFK15
VER 0EFD C7              : CLASS G FOR SET PFK16
VER 0F11 C7              : CLASS G FOR SET PFK17
VER 0F25 C7              : CLASS G FOR SET PFK18
VER 0F39 C7              : CLASS G FOR SET PFK19
VER 0F4D C7              : CLASS G FOR SET PFK20
VER 0F61 C7              : CLASS G FOR SET PFK21
VER 0F75 C7              : CLASS G FOR SET PFK22
VER 0F89 C7              : CLASS G FOR SET PFK23
VER 0F9D C7              : CLASS G FOR SET PFK24
VER 0FB1 C1              : CLASS A FOR SET SDWAOPT
VER 0FC5 C7              : CLASS G FOR SET SESSCHAR
VER 0FD9 C7              : CLASS G FOR SET MSKEY
VER 0FED C7              : CLASS G FOR SET CMDCHAR
VER 1015 C2              : CLASS B FOR SET NEWS1
VER 1029 C2              : CLASS B FOR SET NEWS2
VER 103D C2              : CLASS B FOR SET NEWS3
VER 1051 C2              : CLASS B FOR SET NEWSFILE
VER 1065 C7              : CLASS G FOR SET EDS
IDRDATA TNL27002
*
NAME TPTPTRAC
VER 03A1 C1              : CLASS A FOR TPTRAC OFF
VER 03B5 C1              : CLASS A FOR TPTRAC RPL
VER 03C9 C1              : CLASS A FOR TPTRAC DATA
IDRDATA TNL27002
*
NAME TPVTERM
VER 0635 C7              : CLASS G FOR VTERM ALL
VER 064D C2              : CLASS B FOR VTERM SESSIONS
IDRDATA TNL27002
```

Example three

```
*   THIS ZAP CHANGES THE ALIAS CREATED BY THE DYNAMIC
*   PANEL FROM PFK1, PFK2 ETC.. TO ID.1, ID.2 ETC.
*   REPLACE THE 3 CHARACTERS 'PFK' BY ANY NON-SPACE
*   CHARACTERS. REFER TO TNL0004 FOR FURTHER DETAILS
*   MULTSESS V1.1 OR ABOVE
*   FIX LEVEL 750 OR ABOVE REQUIRED
*
NAME TPCP1
VER 1BD4 D7C6D2
REP 1BD4 C9C44B
IDRDATA TNL27004
```

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